ACCOUNTING EDUCATION: CLOSING THE GAP BETWEEN TECHNOLOGY, EDUCATION AND ACCOUNTING IN HIGHER EDUCATION INSTITUTIONS

by

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I, Nadia Rhodes, hereby declare that the work contained in this thesis is my own original work and that I have not previously in its entirety or in part submitted it at any university for a degree.

_______________________   _________________________
Signature: Nadia Rhodes      Date
ACKNOWLEDGEMENTS

I believe the orchestration of every event, of all things, from being accepted as a student, the conceptualisation of the ideas and to the completion of this thesis, was made possible by my God. God is good all the time. All the time God is good.

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<td>Cultural-Historical Activity Theory</td>
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<tr>
<td>DBR</td>
<td>Design-Based Research</td>
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<tr>
<td>DoE</td>
<td>Department of Education</td>
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<td>ICT</td>
<td>Information and Communication Technology</td>
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<td>NCS</td>
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<tr>
<td>SAICA</td>
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1.1 INTRODUCTION

As technology has changed over the past few decades, the roles and job descriptions of finance specialists have evolved to place greater reliance on it. However, accounting education appears not to have kept pace with these changes, creating a deficit in the skills that accounting graduates require in the workplace, particularly in information and communication technology (ICT). The development of both ICT skills and knowledge is imperative and their integration into accounting education has been identified as adding value to both graduate and employer. The processes followed to address this deficit are key features of this study.

1.1.1 The changing accounting environment in industry

Management Accounting is a specialised area of accounting that is mainly applicable to the manufacturing environment; however it is an integral part of the science of accounting and therefore relevant to this study. Twenty years ago a survey of academics and industrial engineers was conducted on how to make Management Accounting more relevant to the high technology manufacturing and service industries (Mansuy, 1993). Both groups agreed that students needed more practical application of management accounting (using computers) and less theory. Based on the findings, Mansuy (1993) maintained that integrated models could help students prepare for their entry into the corporate world.

The roles and the job descriptions of finance specialists in the corporate world have evolved so that there is a greater reliance on technology. A study by Johnson and Johnson (1995) of accounting-related positions placed in 1,465 advertisements in 1973, 1983 and 1993 highlighted an increasing need for accountants to have computer skills. In 1973, only 1% required the applicants to have computer skills, while in 1983 the percentage had risen to a moderate 6%
and by 1993 it was over half. An informal analysis of job advertisements in the *Sunday Times* newspaper (3 September 2006) found that 77% of a sample of 159 accounting related job advertisements required a measure of computer literacy, 7% required trainees with little or none and 16% had insufficient information (Rhodes, 2006). In March 2010 a similar analysis of 297 accounting-related job advertisements published in the *JobMail* (published weekly, no 8/2010 for the week ending 10 March 2010) found that 62% of the accounting-related job advertisements specified the requirements for accounting software skills. There are dedicated accounting software packages available to industry and the skills required were mentioned by name, predominantly *Accpac*, *Pastel*, *VIP Payroll* and *QuickBooks*. Where the advertisements did not specify the skills required in accounting software it was clear that computer literacy was a crucial aspect under consideration. Some 55% required the applicant's particulars, such as CV, to be e-mailed, which implies an expectation that he or she would have computer literacy skills as well as access to computers. The *JobMail* claimed that 45,000 jobseekers had placed their CVs on the website, indicating a greater acceptance and reliance on ICT in industry, as also evident from a study conducted by Glover, Blankley and Oliver (1995) which revealed that simulated business experience using technology may help one to understand current operations and emerging issues in the business environment. Technology integration into accounting is, however, a complex field, and Tozoglu and Varank (2001) have proposed that aspects to be considered include the environment (extrinsic) and personal (intrinsic) aspects.

In regards to the environmental aspects (extrinsic) it seems that technology and accounting have been merged in industry to the extent that manual accounting systems have become insignificant in the formal sector. Advances in the use of technology in portions of the traditional accounting field are resulting in manual accounting systems fast becoming obsolete and some individuals (intrinsic personal needs) trained as accountants before the use of technology must now find alternative ways of becoming valuable to their employers. The training needs of the accounting industry (Tozoglu & Varank, 2001) are aspects that need to be considered, and I argue that the accounting undergraduates are more receptive to the training needs of the accounting environment. The increase in availability of
computers at school, university, home, and internet cafés allows them to enter university with more exposure to computer technology than in previous years, and they therefore readily embrace ICT as an integral part of their studies. Despite the technological revolution in industry, a wider acceptance and use of ICT in society, and some integration of it in schools by the Department of Education (DoE), accounting pedagogy in higher education has continued to use the traditional manual system (Kalman & Ellis, 2004).

1.1.2 The changing accounting environment in schools

At school level a formal attempt is being made to close the gap between accounting education and ICT. In 2004, the DoE recognised that a global revolution was taking place in education and training in response to the information age, and has since followed its own guidelines in the National Curriculum Statement (NCS) by recommending the use of an accounting package (DoE, 2004) in accounting pedagogy. In addition, it issued a document entitled Guidelines for ICT Integration with NCS subjects in Grades 10-12, which aimed to assist schools in the process of integrating ICT with their teaching and learning. This document stated that “students would benefit significantly by using a computer to achieve these learning outcomes and assessment standards”. The guideline for accounting suggested the accounting software for education at schools as Pastel, QuickBooks and Interactive Business (DoE, 2004).

Despite this focus on software and practical skills, however, the NCS does not exclude the traditional “chalk-and-talk” method of instruction, but rather complements it by accepting that technology is now a part of “a comprehensive accounting education”. There are differences in opinion as to the logistics of fitting the manual accounting process into the teaching and learning of accounting principles, with Hoyt (1996) stating that the student must first master the principles and concepts in accounting and experience the manual preparation of documents before automated procedures are integrated. On the other hand, in a study conducted at South African high schools, Fridman, Dasoo and Basson (2003) found evidence that ICT added to the students' motivation and interest in accounting and their understanding of the relevance of computers in commerce.
and industry. The modern emphasis should be on learning accounting through incorporating ICTs into the teaching and learning process, without losing the fundamental understanding of the information flow through the accounting system that the manual one offers. ICT integration would not undermine the principles and concepts of accounting but serve to enrich and create a realistic environment in which accounting education can develop.

1.1.3 The accounting environment in higher education

With the growth of technology in the United States of America (USA), the USA government has invested significant funds in computer technology in schools. Many studies highlight benefits to students when education and ICT are integrated, showing that computers are able to enhance student motivation, interest and attention to classroom activities (Tozoglu & Varank, 2001). California State University (one of the largest in the USA), over a decade ago, cites the use of technology as one of the major strategies used in improving student throughput (Olsen, 2000). Other benefits have been cited concerning technological instruction, in particular by Reganick (1994), who states that technology helps students to shift from passive to active learning and that the use of computers can significantly improve academic achievement, behaviour and writing skills, and reduce interpersonal deficits. Goffe and Sosin (2005) found that the most successful integration of new technology encouraged students’ active involvement, increasing opportunities for interaction and thus deep learning (Goffe & Sosin, 2005). Technology must be integrated into the coursework if learning is to be active and functional, and staff development is a key ingredient in this integration (Reganick, 1994). With the integration of ICT and accounting education the active involvement of the students will be greatly enhanced.

Berger and Cretchley (2005) found that even students with the least access to computers appreciate the opportunity to learn to use technology and feel that the learning experience added value to their careers. In a summary of an integrated list of ICT skills, Wessels (2005) highlighted the need for an accountant to have an understanding of the workings of an accounting package and the ability and skill to use technology in performing daily business tasks. Wessels (2004)
identified that in higher education the curriculums are outdated and do not target the skills and knowledge as required in the workplace and accounting training was focused on the content to the detriment of skills development. Studies have shown (Berger & Cretchley, 2005; Wessels, 2004, 2005, 2006, 2007) that there is a gap in the graduates’ education and consequently they have to be taught by their employers to understand the systems in place and how to work on accounting software.

The advantages of learning in authentic situations have long been recognised in the higher education arena (Herrington, Reeves, Oliver, & Woo, 2004), and internship gives time in a genuine workplace to perform authentic tasks with real-life consequences and outcomes. Herrington et al. (2004, p.5) argue that learning with authentic activities “is not constrained to learning in real-life locations” and the design of learning environments in higher education can include elements of authentic, real-life and engaged learning. A graduate’s education in accounting would thus be more adequate if employment were offered in an accounting position with the required ICT skills. I argue that the education provider should teach the student to understand the mechanism of accounting packages and not just the function thereof. I believe the use and understanding of the software packages should be integrated into the whole learning experience. This would add value to both the graduate and industry, closing the gap between what is being taught and accounting practice.

Regarding training of accountants in higher education, the South African Institute of Chartered Accountants (SAICA) has recognised a need to review the effectiveness of the current education and training model with a view to aligning accounting education and technology without compromising the current education standards (Cloete, 2006). It appears that the coming together of these disciplines in the real world requires education to keep abreast with change and to educate students in the theory of accounting and in the current ICT developments in the field.

A need for the integration of accounting education and ICT in order to add value to the graduate and to the employer has been identified. Cloete, Senior Executive: Education and Training of the SAICA, in his speech at the Value 2006
Economic and Financial Sciences conference of the University of Johannesburg (UJ), described technologies as a “converging tidal wave” affecting every aspect of modern life. He identified the following challenges in the accounting profession:

- Information technology is redefining the accounting profession
- The marketplace is being driven by developments in information technology
- Technologically skilled accountants are now a necessity as traditional skills are being replaced by technology.

The accounting profession (in private practice) has also changed to keep pace with the transient technological environment, adopting and adapting new technologies for an ever-growing informatics arena. The training of students should therefore keep pace with the technological use in business in order that graduates can join the profession as trained entrants rather than as ones who need to be updated by the company in the use of ICT. The problem in accounting education is to deliver competent accountants who have the ability to function in a technologically changing business environment (Wessels, 2006).

In a further study of the current ICT education offered to accounting students at South African universities conducted in 2007, Wessels found that they obtain limited exposure to the use of accounting packages and that strategies need to be identified and implemented to close the gap and ensure that they acquire the ICT skills necessary to function as competent accountants. At UJ, the career-focused National Diploma in Accounting has not kept up with the advancement in accounting technology as used in industry. A diploma student in accounting has no exposure to ICT as the diploma was reconstructed with effect from 2008 (University of Johannesburg 2007, 2008).

In a study conducted by Boshua (1997), evidence revealed that computer technology had not been sufficiently integrated into the teaching of accounting, whilst Wessels (2004) discovered that “70% of students feel that the inclusion of ICT as one of the core subjects is crucial for their future career as professional accountants”. A technological global society requires graduates to compete
globally on a technological level, therefore the problem is a need for a Higher Education Institution (HEI) to produce graduates with the skills and knowledge to compete globally. They should be able enter an office, switch on a computer and manage to adjust to whatever accounting software package is in use.

Experience on one accounting software system would enable a graduate to adjust to any package, which is preferable to the current situation of students being taught by the old ‘chalk and talk’ mode, and only being exposed to an accounting package in the degree programme. In the diploma programme at UJ all exposure was removed in January 2008. Since there is no experiential learning on the accounting programmes at the University it is imperative that students have in-depth exposure to accounting packages, with the skills acquired playing an integral part. In order to address the gap in Higher Education between accounting education and accounting practice, I believe it is necessary to reform accounting education with the integration of accounting software skills. I concur with Reganick (1994) that it is essential that the staff be developed and that their accounting software and accounting education pedagogical knowledge is a key ingredient for the integration. In order to reform the pedagogical knowledge a planned series of interventions (PSI) for the staff in the department of Commercial Accounting was formulated.

1.2 PROBLEM STATEMENT

At present there is no integration of ICT in the teaching and learning of accounting education of diploma programmes at the University and very limited exposure to it in the degree programmes. This study endeavours to address the problem of the gap between accounting education and practice, and develop an implementation plan that will close it, thus equipping graduates with the skills and knowledge required in the workplace. Against this background, the following research questions are posed:

Question 1: How do the design elements of the study serve to verify and validate the identified gap in accounting education?
Question 2: What is the optimum design of the integration model to facilitate the integration of accounting education into accounting software?

Question 3: What is the optimum design of the planned series of interventions (PSI) to facilitate a practical and feasible process to close the identified gap in accounting education?

Question 4: How effective is the proposed process using the integration model and PSI to address the identified gap?

1.3 PURPOSE OF THE INQUIRY

The purpose of this study is the design of an educational accounting integration model and a planned series of interventions (PSI) for use in higher education for the promotion of deep learning through the integration of ICT, accounting education and the practice of accounting in industry. The purpose of the inquiry is also to verify the gap that exists in the skills and knowledge of ICT of present graduates and the skills and knowledge of ICT as required in industry. This enquiry will address the process needed to close this gap by means of a reform of accounting education. The integration of ICT in accounting education will potentially lead to a graduate better equipped with the knowledge and skills required in industry.

1.4 AIMS AND OBJECTIVES

The general aim of this research is the development of an implementation plan for the integration of ICT into accounting education, and the development and design of a PSI to promote deep learning and close the gap between education and practice in accounting in higher education. The design of the PSI will be tailored to equip the lecturers with the skills needed to implement the changes in accounting education to better align accounting pedagogy to the requirements in the work place for a better skilled and knowledgeable accounting graduate.

The following are objectives of the study:
• to document the PSI used to integrate ICT and accounting education for undergraduate accounting diploma students at UJ

• to document the integration model through which the PSI will operate

• to consider the design logic for the integration of ICT in accounting related subjects such as auditing, cost and management accounting and taxation, for the holistic development of the student

• to inform theory in the integration of accounting education and ICT.

The envisaged contributions of this study are mainly in education in the higher education arena, as I foresee the integration of these essential elements in education as a means of bridging the gap between accounting education, ICT and accounting practices.

1.5 CONTRIBUTIONS

The main contribution envisaged is an implementation plan, including an integration model through which the PSI will operate. I will present both for the improvement in the teaching and learning of not only accounting but also related subjects for the holistic development of the graduate. Other benefits envisaged will be a better skilled graduate in ICT and accounting, and the removal of redundant sections from the curriculum of the Diploma in Accountancy at UJ. The reinforcement of the basic and fundamental concepts in accounting will lead to an improved throughput on all three years in accounting. The linking in the design of other disciplines and subjects overlapping with accounting should ensure a more holistic education and development of the graduates. The methodological contribution within the auspices and framework of learning theories will be an increased recognition and awareness of the role of best education practice in the teaching of the science of accounting. The theoretical contribution will be the design principles for each of the four stages of the implementation plan, including design principles for the identification of the gap, the integration model, the PSI and the practical implementation stage.
1.6 RESEARCH METHODOLOGICAL PERSPECTIVE

Qualitative research spans multiple disciplines, fields and subject matter, and elicits many perspectives (Denzin & Lincoln, 2003). This study involves the integration of, and therefore the disciplines and many perspectives of, education, ICT and the science and practice of accounting. Merriam (1988) maintains that qualitative research is suitable for dealing with significant problems found in practice. The subjectivity of the researcher becomes an integral part of the study (Flick, 2006). My direct involvement and participation will add value and strength to the interpretation and analysis of data and, as Babbie and Mouton (2001) claim, objectivity is not a feature of the researcher but rather of a logical and coherent process followed which will add weight to the evidence. Participative research, where there is a closer collaboration between the researcher and participants, adds value to the trustworthiness of the research process (Denzin & Lincoln, 1998). This applies to this study, in which the participants’ world will also be mine, and will facilitate my understanding of their experiences.

Qualitative research is primarily the understanding of the meaning of an individual’s world as socially constructed through experience (Merriam, 2002; Schwandt, 1994). The notion of increasing understanding through qualitative research is defined and clarified further by Leedy and Ormrod, (2010), as a logical and impartial process of collection, analysis and interpretation. Merriam (1988, 2002 & 2009) and Creswell (1994) qualify qualitative research as having the following characteristics:

1. It strives for a deep understanding of the individual’s world.

2. The researcher is the primary instrument for data collection and analysis and therefore the researcher’s own biases and shortcomings will need to be identified and monitored as these affect the interpretation of the data.

3. Qualitative research is inductive and the use of theory must fit into the reasoning of the inductive process (Creswell, 1994), and aim at building concepts or theories rather than deductively arriving at hypotheses for testing. Qualitative research is about the discovery of new relationships, concepts and understanding rather than verification (Merriam, 1988).
4. Qualitative research is on the whole descriptive with words and pictures rather than numbers to convey findings (Merriam, 2002, 2009).

This study will focus on an understanding of colleagues’ experiences in accounting education and software, drawing on education theories and accounting practices to design interventions to reform their pedagogies, thereby integrating education and ICT in the classroom. My approach will embrace the interpretive framework to incorporate their experiences in the design of the interventions.

Gravett (2001, p.13) refers to the “mechanics and pragmatics of intelligence” and writes that adult cognition is related to their life tasks, life worlds and life experiences. I therefore recognise the accumulated experiences of my colleagues in the department of Commercial Accounting for successful change in their pedagogies to take place: “These personal constructs will provide the framework through which all new learning is appropriated” (Gravett 2001, p.13) and the necessary link for the transformation in accounting education. Practical considerations for the interventions must also be viewed and considered.

The study aims to transform the accounting educational landscape with the incorporation of accounting software. This combination of practical application and educational reform led me to embrace the design-based research (DBR) approach, as the aim will be to create a practical and effective series of interventions (Reeves, 2000).

1.6.1 Philosophical and theoretical framework

A theoretical framework underlies all research (Merriam, 2009) and the assumptions become relevant to the understanding of the process (Flick, 2006). The research of this study will be within a theoretical framework of Cultural – Historical Activity Theory (CHAT), as this recognises the forces and relationships between the variables in the environment at UJ in which this change in accounting education will need to take place.

The conceptualisation process of this study, which Babbie and Mouton (2001) refer to as the process of identifying and clarifying concepts began with my
experiences in commerce and carried over to my lecturing in accounting. The conceptualisation of the research problem was formed and can be accurately described by the ‘Three Worlds Framework’ identified by Babbie and Mouton (2001, p.15), an adaptation of which is shown in Figure 1.1 (below).

1. World 1: the world of everyday life or pragmatic interest

2. World 2: World of science or the epistemic interest

3. World 3: the world of metascience or the critical interest world.

They also emphasise that the term ‘world’ is not a literal one, and that ‘frame of reference’ better explains the interweaving of these worlds (Babbie & Mouton, 2001, p. 15). Metascience in World 1 is the critical interest sphere, of which Mouton (2009) gives the example of methodology of scientific research, reflecting on its practice as going beyond or transcending science. World 2 is referred to as the epistemic world, in which one reflects on the natural or social world through a process of systematic and rigorous inquiry (Mouton, 2009). In World 3, a knowledgeable person knows what to do and how to do it (Mouton, 2009). This is a person’s pragmatic interest and the emphasis is on what is done and the outcomes rather than the theory (Mouton, 2009; cf. Babbie & Mouton, 2001). Babbie and Mouton (2001) regard the Three Worlds Framework as merely a tool in assisting the understanding the nature of scientific practice. As an aid, I have adapted this model to link my frames of reference.
My world view or paradigm (refer to Figure 1.1 above) as the researcher is shaped and moulded by fundamental beliefs that inform my actions (Denzin & Lincoln, 2003, 2003a) and the questions that I raise will be derived from my view of the world (Merriam, 2009). My belief is that there is a real and attainable potential to change the practice of accounting education to embrace the integration of ICT and that this will result in a better accounting graduate with the knowledge and skills required in industry. Denzin and Lincoln (2003b) also maintain that all qualitative research is interpretive in the exploration of peoples’ experiences (Babbie & Mouton, 2001; Bywaters & Letherby, 2007; Gray, 2009; Henning, van Rensburg & Smit, 2004) and that the critical and constructivist paradigms further structure the research. The critical paradigm suits a process of investigation with the emphasis on “questioning and challenging” with a view to
change for the better (Babbie & Mouton, 2001; Gray, 2009) and redesign for the better through critical reflections (Henning et al., 2004). It is my intention that through the process of investigation facilitated in this study the practice of accounting education will improve. It will be through a cyclical process of reflection and refinement that an integration model and the PSI will be designed and developed for the process of change to be accommodated. It is therefore necessary for the interpretive paradigm to be identified and incorporated in this study as the philosophical and theoretical assumptions frame this research and my viewpoint which impacts on it (Henning et al., 2004).

The set of lenses through which I view this study is influenced largely by my experiences in education and in commerce, the latter of which include the integration of the business entities’ accounting manual systems and policies onto a fully integrated accounting software system. This has formed the impetus of this study, which is the forging of the accounting practice and accounting education. Furthermore, the experiences were based to a large extent on practical considerations and consequences, hence my pragmatic approach. My research was also influenced largely at the initial design stage by the experiences of my colleagues and their experiences in education. I will interpret and critically approach these to incorporate them in the initial plan and design.

1.6.2 Methodological assumptions or epistemic interest

Merriam (2002, 2009) emphasises the qualitative research characteristics of experience, understanding and meaning-making assumptions, and these form the basis of my methodological assumptions:

- My focus will be on understanding of the lecturers’ experiences and problems to inform the design of the interventions.

- The researcher is the primary instrument in the data collection and analysis, in which the researcher’s experiences will be ‘closer to reality’. This means that the interpretation and ‘internal validity’ will be considered a strength of this research (Merriam, 2002:p.25)
The research process is deductive, whereby the researcher will gather data to design and construct interventions that will reform current pedagogies in accounting education.

The proposed developmental design-based approach (Reeves, 2000) and the activity system as conceptualised by Engeström (1999) inform the methodological assumptions of this study. Combined with the multiple method of data collection validation and crystallisation of the findings they should be evident for the construction of a coherent and clear picture (Henning et al., 2004).

1.7 RESEARCH DESIGN AND FRAMEWORK

CHAT is regarded as an essential navigational chart for educational research and practice by Roth and Lee (2007), who demonstrated the evolving theoretical framework has a paramount potential to overcome problems in educational theory and practice. The design of the interventions for the integration of accounting education and accounting software will be framed by CHAT as it will be based on a “complex system of actions, tools, members, rules and a community” (Engeström, 1999,p.31). The activity system as conceptualised by Engeström (1999) recognises all the interlocking forces and relationships that will need to be recognised in this research.
Figure 1.2: Model of an activity system. Engeström (1999:31)

The activity system (Figure 1.2, above) in this enquiry will initially be based on the department of Commercial Accounting for the diploma qualification environment in which my colleagues (the subjects) will engage with the integration programme (the object of the activity) through activity mediated by ICT (the tool) for the transformation of their skills and knowledge in accounting practice (the outcome), thereby reforming educational practice. The community comprises all the stakeholders affected, whilst the rules and division are, for example, the faculty regulations and the management of the department.

The design will be within the frameworks of CHAT and DBR, with the aim being to create a practical and effective (Reeves, 2000) series of interventions for this existing gap in accounting education to incorporate ICTs into accounting education. The PSI will work through the integration model, specifically designed for the integration of accounting education and ICT.

DBR (Barab & Squire, 2004) will form the impetus of this research, likened by Babbie and Mouton (2001) to the blueprints or plans of a house.
1.7.1 Design-Based Research

The reform of the practice in accounting education can only be conceptualised by design-based research (DBR), the expected environment of which is described by Barab and Squire (2004, p.4): as involving “multiple dependent variables; focus[ing] in on characterising the situation in all its complexities; … flexible design revisions; … complex social interactions; … looking at multiple aspects of the design and developing a profile that characterises the design in practice”. The six crosscutting features identified by Cobb, Confrey, diSessa, Richards and Schauble (2003), and which form the basis of this design logic, are encapsulated as:

1. developing a class of theories about the process of learning
2. the design to support that learning
3. being highly interventionist
4. being prospective and reflective
5. having an iterative design
6. developing domain specific theories that ‘must do real work’.

Reeves (2000) maintains that researchers with development goals are focused on solving teaching, learning and performance problems in a body of theoretical design principles that can inform future development efforts. The basic iterative design that Reeves (2000) and Amiel and Reeves (2008) proposed as development research has been adapted to illustrate the salient features of this design logic (Figure 1.3, below).
This initial DBR will incorporate the features of Figure 1.3:

- the analysis of relevant issues by means of a focus group and interviews with lecturers facilitating ICT in the accounting department to analyse and inform initial design of integration programme – phase 1
- the development of the programme within a theoretical framework of CHAT and consideration of a further activity system for integration of ICT and accounting education in the degree course – phase 2
- three workshops with colleagues in the diploma programme to evaluate the programme – phase 3
- feedback forms from each workshop to validate the design and incorporate feedback into the design of the programme to promote implementation of the programme through their collaboration and support – feedback cycles of refinement and authentication.

1.7.2 Design phases

The basic iterative design that Reeves, (2000) proposed as development research has been adapted to illustrate the salient features of this design logic (Figure 1.3, above). The four main phases provide this study with a map of the
phases from problem identification to verification and documentation of the planned series of interventions. The phases are sequential and each is linked in a cycle that informs the next as well as itself being refined and validated as the study progresses. Lautenbach (2005) highlights the difficulty in portraying research practice as a linear and sequential process, it being rather a cycle of expansive cycles the progression of which maintains its focus but allows real-life issues to be integrated and accommodated.

The main focus of the first phase is data collection and analysis by means of two focus groups and an interview. The participants of the focus groups are staff members of the department of Commercial Accounting in which the accounting undergraduate diplomas are presented. The interview will be held with a lecturer in the degree programme to draw from her experience in lecturing accounting software to the degree students. The objective of the focus groups and interview is to inform phase two of the design. Data collection and analysis strategies to be implemented in this study are found in Chapter 3.

Due to the practical implementation of this study the following limitations and delineations need to be defined and clarified at this stage:

- This study focuses on the undergraduate diploma lecturers. It is hoped that the contribution of this study will be adapted initially in the department of Commercial Accounting; hence the interventions being focused and tailored for the department.

- At the time of writing this report, the diploma was in the process of being reconstructed and aligned to a profession qualification. A requirement for this alignment is the integration of accounting software in the curriculum, and management have prescribed Pastel as the accounting software to be used in the integration. Wessels (2006) found that Windows operating systems “dominate the South African market with a total of 71% of installations” and that 73% of small to medium-sized enterprises (SMEs) use the accounting software: Pastel. However, in 2002, 86% of the midrange enterprises had Accpac installed, due to its excellent flexibility and functionality. In summary of the enterprises surveyed, Pastel had
66%, QuickBooks 12% and Accpac 10%. Wessels recommended Pastel as the main accounting package with which to train students (Wessels, 2006/2006a).

- This study, therefore, excludes a cost benefit analysis to highlight the accounting software best suited for the integration, and Pastel has been adapted in the study as the accounting software to be integrated into accounting education.

These practical implications and the department’s needs which pertain to this study will be considered throughout, with a number identified in a workshop for staff in the department. The strategies at the first workshop will be to present an initial design of the planned interventions as well as the integration model and to obtain staff buy-in and support for the aims of this study. A second workshop will evaluate the design of the interventions which, when adapted, form a springboard for the practical implementation of the interventions to the staff. These workshops will be part of the third phase of the design logic, and the methodologies for the analysis and interpretation of the data collected at the workshops are found in chapter 3. The feedback from the workshops will validate the design which is the final phase of the design logic. This system of continual evaluation and review throughout the four stages will enable the transformations within the human activity system to be implemented and thus enable the research to take place in expansive cycles (Lautenbach, 2005).

The successful design of this integration programme will not be possible without my colleagues’ collaboration and shared learning experiences. However, this synergy to be achieved by the pooling together of our skills and knowledge has to be set within the framework of learning theories, activity theories, CHAT, research literature that informs this study and the current practice of accounting, all of which are necessary to guide and validate this study. These multiple sources of data that inform the design by its iterative nature will result in “rigorous, empirically grounded claims and assertions” (Cobb et al., 2003, p.12).
1.7.3 **Focus and refinement of this study research process including the research design**

With the aid of Babbie and Mouton’s (2001) Three Worlds Framework I focussed and refined the conceptualisation of the research process of this study (Figure 1.4, below).

![Figure 1.4: Focus and refinement of conceptualisation of research process. Adapted from Babbie and Mouton (2001): Three Worlds Framework](image)

The information core, Babbie and Mouton’s (2001) World 2, is a process of systematic and rigorous inquiry, where CHAT and the related activity system as conceptualised by Engeström, (1999) frame this research process. The research design is guided by DBR (Reeves, 2000). The worlds of real life, or my personal experiences, World 1 of meta-science and related studies continue to inform this study.
1.7.4 Strategy to promote validation, trustworthiness and reliability

Key features in any research are the production of valid, trustworthy and reliable knowledge, as argued by Merriam (2009), Hofstee (2006) and Bywaters and Letherby (2007), as the research process affects the quality of the research product and outcome. For Mouton and Marais (1994), reliability is dependent on four variables: the researcher, the participant, the measuring instrument and the research context. The qualitative research strategies to promote authenticity and trustworthiness are based on worldviews and need to be compatible and in harmony with the philosophical and theoretical assumptions underlying the research (Merriam, 2009).

Internal validity is the strength of qualitative research, because the researcher is the primary instrument of data collection, analysis and interpretation. It is of paramount importance to “understand the perspectives of those involved, to uncover the complexity of human behaviour in a contextual framework, and to present a holistic interpretation of what is happening” (Merriam, 2009, p.215).

Merriam, (2009) proposes that multiple methods and multiple theories serve to confirm findings as a form of ‘triangulation’, which is said to go “beyond the limits of a single method” with varieties of data and analysis methods to promote validity (Flick, 2006, p.24). Internal validity is boosted by triangulation (Babbie & Mouton, 2001; Flick, 2007; Gray, 2009), and from an ‘interpretive-constructivist perspective’, which is a theoretical assumption for this study, Merriam (2009) supports triangulation as a “principal strategy to ensure validity and reliability” (Merriam, 2009, p.216). Denzin and Lincoln (1998) define a means of triangulation as the use of multiple methods and/or multiple sources of data collection. The data are cross-checked through the different sources and/or methods (Merriam, 2009). Triangulation and the resulting validity is supported by Mouton (2001), when the importance of the research process is highlighted as the quality and strength of the evidence having a direct bearing on the quality of the interpretations and resulting conclusions. Merriam also states that internal validity, reliability and trustworthiness are enhanced by means of “adequate
engagement in data collection” and the researcher’s position needs to be explicit in terms of the assumptions regarding the research (Merriam, 2009, p.219).

1.7.5 Strategy to promote ethical research practice

Ethics in research includes appropriateness of the researcher’s behaviour in relation to the rights of those who are the participants in the study or are affected by it (Saunders, Lewis, & Thornhill, 2009). Good ethical practice is a key feature of good research where the researcher is closely involved with and an integral part of the process. Good ethical practice and procedures need to be clear and sound, so that such transparency also serves as a validation process for the study (Bywaters & Letherby, 2007; Nolen & Vander Putten, 2007). Codes of ethical conduct include informed consent, privacy and confidentiality, accuracy and keeping stakeholders informed of the progress (Christians, 2003). Merriam (2009, p.228) states that the “validity and reliability of a study depend on the ethics of the researcher”, therefore it is important to adhere to accepted norms and values with regard to ethics in scientific research (Lodico, Spaulding, & Voegtle, 2006; Mouton, 2001) and that ethical appropriateness is a prerequisite for the quality of the research process (Flick, 2007a).

The research will follow strict ethical guidelines as laid down by the Faculty Academic Ethics Committee to protect the dignity and the rights of participants and ensure that it is conducted in a fair and equitable manner. Participation by colleagues will be voluntary and written consent obtained from all participating lecturers as well as clarification given of their right to withdraw from this research without prejudice. The researcher undertakes to inform the participants of the benefits of their participation and that feedback shall be given about the research as it became available. The participants in the workshops and focus groups will be anonymous and interview pseudonyms used to protect their identity.
1.8 OVERVIEW OF RESEARCH

Chapter 1 has introduced the enquiry and provided a general orientation to this study, as well its objectives and how these were achieved. It has also provided the philosophical, theoretical and methodological assumptions underpinning it.

Chapter 2 focuses on the plan of the design and the reasoning behind the flow of the design through its cyclical process. The design logic has mapped out this research journey and provided guidance and direction throughout its journey to its destination and research goal.

Chapter 3 outlines the methodology of design-based research and data collection and analysis techniques.

Chapter 4 presents the research findings, from the focus groups and interview staff workshops, followed by the conceptualisation of the integration model and the process to close the identified gap.

Chapter 5 comprises an analysis and interpretation of the design principles from all the findings.

Chapter 6 summarises the findings, draws conclusions and makes suggestions for further research.

1.9 CHAPTER SUMMARY

Accounting education has not evolved to keep pace with the changing role and job descriptions of financial specialists or their greater reliance on technology. The rationale for the study put forward in this chapter is that transformation is necessary in accounting education if higher education graduates are to develop the skills and knowledge required in industry. The transformation in essence is the integration of accounting software in accounting education, where education teaches through ICT rather than about ICT. The reform of accounting education with the integration of accounting software and accounting education at the University of Johannesburg began the process of implementation in January 2011, in the department of Commercial Accounting for the Diploma in
Accountancy. It is being implemented according to the recommendations of this research.

The methodological perspectives underlying the research have been presented in this chapter, including the researcher’s philosophical theoretical and methodological assumptions. The research project is a design-based enquiry framed by CHAT and based on an activity system as conceptualised by Engeström. Strategies for validation, trustworthiness, reliability and ethics were also included in this chapter.
CHAPTER 2:  
INFUSION OF THEORETICAL FRAMEWORK AND RESEARCH DESIGN

2.1 INTRODUCTION

This chapter begins with a discussion on the qualitative nature of this study and the personal iterative cycles (PICs) of design-based research (DBR) and how they have been adapted to address the research problem, namely that at present there is no integration of ICT and accounting education. DBR is the best fit design type to close the gap, whilst Cultural-Historical Activity Theory (CHAT) has been infused in the DBR design and its influence as an analysis and thinking tool highlighted. This chapter provides the theoretical base and analysis of the published works pertaining to DBR and CHAT, contextualising them as the design base. For Babbie and Mouton (2001) there is a distinction between the design of a study and its construction and methodology, and in this chapter I focus on the research design, often seen as a map to the research journey (Badenhorst, 2008; Mouton, 1996; cf. Greyling, 2007). The design logic provides guidance to the research goal, set within the framework of CHAT, and applicable to reform in education research and practice (Roth & Lee, 2007). One of the main characteristics of this study is its pragmatic nature, with CHAT and DBR both identified as having practical and effective potential to effect change in the educational environment (Reeves, 2000; Roth & Lee, 2007).

The data collection methods used in this study support the nature of qualitative research as the main sources of information or data collection, namely focus groups, an interview and three staff workshops.

2.2 THE QUALITATIVE NATURE OF THE STUDY

A definition of qualitative research is the understanding of ‘social phenomena’ by analysing the experiences of individuals or groups and “interactions and communications in the making and/or by analysing documents which reflect...
experiences or interactions (Flick, 2007a, pp. x-xi). The focus groups and interviews provided data for understanding the experiences of the participants, whilst the staff workshops provided data on feedback forms for the insight into their experiences. The three data collection methods facilitated discussions, thereby providing a source of “interactions and communications in the making” (Flick, 2007a, pp. x-xi). Common to each is analysis of how people construct the world around them, with Flick (2007) listing seven common features of qualitative research, presented in italics below (2007, p. xiii), all of which are relevant to the study.

Firstly, Flick (2007) claims that qualitative researchers are interested in accessing experiences, interactions and documents in their natural context. This was a valid motivational aspect not only for the focus groups and interview but also for the staff meetings. My own findings and developments were facilitated through a cyclical research type matching the nature of action research presented below. All research was based on the primary setting in which the PSIs were to be implemented by participants in their natural context.

Secondly, qualitative research refrains from setting up a well defined concept of what is studied and from formulating hypotheses in the beginning in order to test them. Rather concepts are developed and refined in the process of research. This second claim by Flick (2007) is a key feature of DBR. In this study, four iterative cycles developed and refined the core elements in design phase two.

Thirdly, qualitative research starts from the idea that methods and theories should be appropriate to what is being studied. In the second chapter the DBR and supporting theories are argued as having a ‘goodness of fit’ (Henning et al., 2004, p.36) for this study. Appropriateness of methodologies and theories reinforce the link between the research design and its construction (Babbie & Mouton, 2001).

Fourthly, qualitative researchers are an important part of the research process, as is evident in this qualitative study in terms of my personal experience in accounting education and in accounting practice, as well as my direct involvement as the researcher.
Fifthly, **qualitative researchers take contexts and cases seriously for understanding an issue under study.** The data collection of this study is focused on the staff and their experiences and insights into accounting education.

Sixthly, **a major part of qualitative research is based on text and writing.** Flick (2007) maintains that qualitative research draws its analysis, presentations of findings and interpretations from transcripts, as is the case in this study, with the transcripts of the focus groups, interviews and staff workshop interventions and analysis of the feedback forms from the iterative cycles of DBR.

Lastly, **appropriateness of assessing the quality of qualitative research will need to be discussed in ways suitable to qualitative research.** The issues of ethics, validity and reliability were discussed in Chapter 1 and were used in this qualitative research journey as bonding forces for the effective fulfilment of the research aims (Babbie & Mouton, 2001).

Before the research question was formulated, a gap was identified and the preliminary structure of the integration model took shape within the auspices of my personal experience in accounting education and accounting practice.

### 2.3 PERSONAL ITERATIVE CYCLES AND THE INFLUENCES OF ACTION RESEARCH LEADING TO DESIGN BASED RESEARCH

The personal iterative cycles (PICs) comprised a separate process, which I added to phase 2 of the design, and although not part of the structure they enriched and were instrumental in the identification of the gap and conceptualisation of the integration model. The cyclical nature of action research initially suited the process and defined my early role as researcher in the inquiry. When I first discovered the processes of action research it seemed to be the best fit for the study and I believed that it augmented what eventually grew into a design-based study. Action research is discussed separately at the beginning of this chapter and should not be seen as part of a typical design phase or cycle as such. However, the enrichment value of the PICs is imperative in the identification of the gap and understanding the conceptualisation of the integration model and...
formed the basis of the early investigation that eventually grew into DBR. I maintain that DBR is appropriate to the research design and use action research merely as an avenue through which I am able to explain the process of the conceptualisation of the integration model, identification of the gap in accounting education and ICT, and recognition of the need to initiate a process to close the gap. I feel that the processes of action research were instrumental in funnelling my personal experiences in lecturing and industry. The conceptualisation of the four stages of the implementation plan of this study was facilitated through a series of progressions that I was initially able to identify as synonymous with an action research process. Although there is much debate surrounding the ability of action research as contributory to new knowledge, it did serve to explain the formation of the four stages of the implementation plan of this study: “Action research is one valuable tool for generating new knowledge, solutions, and strategies in response to continuously emerging, questions and problems” (Nolen & Vander Putten, 2007, p. 406). In my own personal experience the knowledge created was more a reflection of my changed epistemologies and pedagogies. It provided impetus to develop the four stages of the implementation plan of this study which were eventually based in DBR.

Action research is a qualitative research methodology and facilitates interdisciplinary research through humanities, social and the physical sciences (Denzin & Lincoln, 2003). Hence, it was initially employed in this inquiry to facilitate understanding of the factors and variables in accounting education, which is interdisciplinary in its nature: “Action researchers in social enquiry aim to generate knowledge and action in the support of liberating social change” (Greenwood & Levin, 2003, p. 146). McNiff and Whitehead (2002, p.20) concur that action research is “practical theorising” and an important methodology in facilitating holistic change and progress in cultural, social and intellectual environments”. They highlight its real potential to improve and change one’s own practice, thereby benefiting society:

“The most powerful and appropriate form of theory for dealing with contemporary social issues is one which is located in, and generated out of practice, and which values tacit knowledge as much as cognitive
knowledge. This all comes down to action research, a way of researching one’s own practice and generating personal theories of practice which show the process of self-monitoring, evaluation of practice and purposeful action to improve the practice for social benefit” (McNiff & Whitehead, 2002, p.20).

Action research into one’s own teaching practice is an important source of knowledge that could lead to change and improvements in teaching and learning (Riding, Fowell, & Levy, 1995). For this reason, I initially identified the concept of change, starting with my own practice in this study, which was supported by the principles of action research elucidated by McNiff and Whitehead (2002, pp. 17-18):

**Action researchers have:**

- **A personal commitment to action for the better.** Action research clarified my initial thought processes and was a sensible starting point for addressing the research problem. One of the purposes of this study is to improve the knowledge and skills of the graduates in the diploma in accounting, thereby closing the gap between accounting education and accounting practice.
- **A professional responsibility to reflect one’s own practice** (Lodico, Spaulding, & Voegtle, 2006). There is a definite connection between my own teaching and the aims of this study. As a practicing accountant I have confirmed that the requirements for a graduate accountant have moved from ‘bean counter’ to ‘value creator’. Value creation needs to take place in a dynamic technological environment and graduates must be proactive contributors to a dynamic and changing business environment, not mass-producers of figures (Whitfield, 2009). The rate of change in technology is so rapid that a software company, Accpac, provides 24-hour online training for users to keep up to date with the changes and developments. There are standard business intelligence packages that assist in the analysis of business data. This is in addition to the standard accounting processing software packages which this study is integrating with the education of accounting. As an accountant and educator I recognise my professional
responsibility to interweave the skills and knowledge necessary for tertiary graduates to enter the business world.

- **A vision for a better future, characterised by creative life-affirming ways of living.** I recognised the need to initiate change in an attempt to improve the education of the accounting graduate by the integration of ICT skills and knowledge.

- **A perception that a small positive life-enhancing action is still an improvement no matter how small.** The reception of the small changes made in my accounting pedagogy was the motivational force for building the foundations for this study, particularly with the introduction of the guide or map of the accounting system included in the integration model.

- **A perception that their own lives must be in order before making judgements about others and are they continually critiquing their own practice.** I have managed to keep up to date with the changing dynamics in accounting software. However, if I focused for some time on research, the relevance to me of the concept ‘use or lose’, for example, becomes a significant consideration. This real and practical factor in the integration of accounting education and accounting software has been incorporated in the design of the integration model.

- **A perception that knowledge is a living process, never static and never complete.** I found it was critical to keep up my involvement in accounting practice to better inform my accounting pedagogy. This provided me with a practical and continual update of the technological improvements in accounting software, as is evident in my own accounting practice that has evolved with the improvements in accounting software.

- **A perception that learning is rooted in experience.** I am fortunate to have kept my experience up to date with the dynamics of change in technology through a process of recognising that experience and learning need to progress as an interwoven and integrated union of skills and knowledge.

Practical issues to consider in the steps of conducting action research are detailed by various authors, including McNiff and Whitehead (2002), Coghlan and Brannick (2005), Lodico, Spaulding and Voegtle (2006), Bywaters and Letherby (2007); McNiff (2009) and Gray (2009). Particular emphasis is given by all to its
cyclical nature and the elements of *plan, act, observe* and *reflect*. McNiff and Whitehead (2002) use their own example to describe the sequence of planning, acting, observing and reflecting which has become known as *the action-reflection cycle*. The example they use is a communication manager in a firm, where the *plan* is to seek to make communications more effective. Weekly information sheets are distributed to the staff members as the *action*. They talk to the staff to *observe* the effectiveness of the information sheets and the feedback they receive facilitates the *reflection* process for additional plans for more effective communication. With reference to Figure 2.1 (below), they explain: “this cycle would then go onto the next cycle of re-planning, acting, observing and reflecting, and perhaps produce a new cycle”. This has the effect of changing thinking and action and may be referred to as learning.

*Figure 2.1: Sequences of action-reflection cycles.*


Action research has influenced educational research to improve educational situations and is a holistic approach that allows for different methods of data collection, thereby facilitating triangulation (Hamzah, 2004). Hien (2009, p.97) has maintained that “action research well matches with education and benefits both teachers and students in their teaching and learning since it meets the need of education and enables continuity in research with its cyclic process”. Although, my initial action research at the time was not clearly formalised, upon reflection I was able to identify steps in the change in my educational practice, which
ultimately led to the benefits reaped by both colleagues and students. Action research as an initial research methodology in this inquiry facilitated the development of an emerging methodology that was ultimately manifested as DBR.

In order to enhance deep learning of accounting concepts I needed to understand my own epistemology so as to influence my pedagogy and thereby potentially change social practices in accounting education. I was able to identify with the cyclical nature of the elements in action research of planning, acting, observing and reflecting (Gray, 2009; Lodico, Spaulding, & Voegtle, 2006; McNiff & Whitehead, 2002). Gray (2009, p.318) reflects on Lewin’s conception and enhances the representation of the cyclical process by adding another overlapping process of activities “that could be running parallel to each other”. I found this in my experience as I was teaching different courses in accounting concurrently. The action research model with concurrent activities by Gray (2009, p.318) is depicted in Figure 2.2 (below).

![The action research model. Adopted: Gray, (2009:318)](image-url)

**Figure 2.2:** The action research model. Adopted: Gray, (2009:318)
This action research model depicted by Gray (2009) in Figure 2.2, as well as McNiff and Whitehead’s (2002) representation in Figure 2.1, has similar core elements, both of which I was able to identify with. In Gray’s (2009) model there were various groups that I was researching concurrently, but the main distinction was in their history and culture as some were employees sent on short courses, also referred to as students in accounting, while others were full-time students. I was able to observe both groups, particularly with the accounting map concept that I was developing. Sequential cycles as defined by McNiff and Whitehead, (2002) led to an acronym being developed as another accounting educational tool. The acronym is “DECI DACL” (pronounce as ‘deckie dackol’), and the students are encouraged to learn it as a rhyme. This is the focal point in the ‘heart of accounting’ and has become a key feature in the integration model. These developments were not possible without planning.

Planning and the achievement of goals form a close relationship and a degree of planning is required to effect change. The plans do not need to be rigid but must be allowed to develop as the research unfolds and progresses (Gray, 2009). This is true for this study as the action research started in a practical and personal environment and has developed to the design of the integration model and PSI for the Commercial Accounting Department. Planning is required in all phases of the research, from the design to collection of data and its analysis. “Planning and systematic collection of data are essential to maintain the integrity of the data” (Lodico, Spaulding, & Voegtle, 2006, p. 292), however, good planning will facilitate the maintenance of focus. McNiff and Whitehead (2002) maintain that the scope of one’s work is different from that of one’s research and the limitations of the study are an important consideration in staying focused. One of this study’s focal points is the integration of knowledge and skills in only accounting education and only the diploma students, although this study is not context-bound and will create opportunities for other research. Lodico, Spaulding, and Voegtle (2006) maintain that a clear focus normally originates in a clear process of reflection on one’s work.

Reflection on one’s work, identification of the problem and the setting of the problem in contextual literature are important processes in the development of
action research and support the need to remain focused (Lodico, Spaulding, & Voegtle, 2006). According to Ferrance (2001), educators work with their own students and own problems which means that they are in a better position to effect real change when research and practice overlap. There is also a need to remain focused and work in close collaboration with others (Bywaters & Letherby, 2007; Coghlan & Brannick, 2005; Gray, 2009; Greenwood & Levin, 2003; Lodico, Spaulding & Voegtle, 2006; McNiff & Whitehead, 2002).

Social research is by its nature conducted in collaboration with others within various environments, therefore it first focuses on one’s own learning and then the circle of influence expands to involve others (de La Bruere, 2005). As Taylor (2002, p.19) wrote:

Preparing to report the experiences and outcomes of action research involves further reflection and analysis which sharpen initial interpretations and give rise to additional insights. In analysing your own experiences and reporting them, you make it clearer to others where you stand and why.

I concurred with this view as I needed to analyse my own experiences and share them with colleagues.

The action research process of refining with further reflections and analysis began when I shared my findings with colleagues and then, more formally, was preparing for the publication of textbooks as a co-author. Feldman and Capobianco (2000, p.1) concur with Taylor (2002) in highlighting the importance of collaboration in action research: “Through reflection on their own practice in collaboration with other teachers and university researchers, the teacher researchers came to new understandings”. Action research facilitates collaboration, thereby creating the space for educators to become more reflective practitioners and so increase the potential to improve teaching and learning (Casbon & Walters, 2004). Therefore, action research functions best in collaboration with others and significantly increases the potential for interactive shared research for the benefit of all the collaborators (Farren, 2008).

Action researchers should not aim for closure but rather continue with the process of reflection, planning, action and observing for further improvements in
the living realm of learning and knowledge creation in practice (McNiff & Whitehead, 2002). Action research, according to McNiff and Whitehead (2002, p.15), is the “name given to a particular way of researching your own learning” and this is where the action research started for this study. At the onset of my lecturing career I had not taught, however I did have ten years’ experience in accounting practice. I am fortunate to say that this included the conversion of a manual accounting system onto an integrated software package, which I believe was a key impetus in this study.

As an inexperienced lecturer with a ten-year exposure to accounting practice it was necessary to teach strictly according to the textbook. In my attempts to make the teaching of accounting as real as possible I was not in a position to ‘show and tell’ but only to ‘tell’, as it was centred on a manual accounting system and there were no opportunities to link to ICT. I felt at times that I was re-learning all the basic accounting principles and that there was a significant difference between doing accounting and teaching it. Conscious that there was no opportunity for deep learning of the basic operational principles of the accounting system, I seized this opportunity to plan, act, observe and reflect upon action changes in this educational setting, starting with concurrent action research on the accounting map (Gray, 2009; Lodico, Spaulding, & Voegtle, 2006; McNiff & Whitehead, 2002).

In teaching a manual accounting system, emphasis was on the ability to focus on one aspect and always be in a position to link it to the whole system. This was necessary if the students were to see the effect on the output and be in a position to judge if this was the desired result. One of the key features of accounting is that the system is made up of distinct and identifiable parts with a specific role and function in the system as a whole. I had to internalise this before I was in a position to design and use it in my classrooms. It was after reflecting on my way of learning and teaching that I developed a methodology, and the integration model is a combination of three conceptualised parts, which I have termed as:

- The map of the accounting system
- The heart of accounting
- The four basic rules of accounting
The guide or map was for students to navigate and find their way through the accounting system, irrespective of where the challenge was situated. The heart of accounting I learnt as a student but would not know to whom to accredit this useful education tool, whilst the basic set of four rules are the cornerstones of the science of accounting and so included. Although all three parts were conceptualised under the auspices of action research, I will only briefly highlight the plan, act, observe and reflect process for the accounting guide or map.

My first step was to conceptualise a type of global accounting system ‘map’ drawn from the prescribed textbook at the time (Faul, van Wyk, & Smith, 1993, pp. 17-20), as my first plan of action for the students to “find their way around the accounting system”. Whenever they needed to access the accounting system they were in a position to determine the correct point of entry and follow the effect through the system to determine the correctness of a particular outcome and its effect on the system as a whole. I was able to observe that the map was appreciated and appeared to be useful as a scaffold in the accounting learning process and I use it to this day in my classes, irrespective of the students’ year of study. It is applicable to any accounting system, manual or computerised, and hence has been incorporated into the integration model.

Realising the integration model needed a process to bring it to life through planned actions I formed a planned series of interventions (PSI) for the staff. This was an important step in the process of changing the epistemologies and pedagogies of the lecturers in the department of Commercial Accounting for which the PSI has been designed. The perception of the need to change was only awakened when the gap was realised and accepted by the lecturers. The PSI was the action mechanism and process through which the integration model would be initially introduced. The PSIs will work though the integration model, and the process of collecting and analysing the data confirmed the structure and design of the integration model. I envisage the model growing, developing and adapting to different challenges, and the action research process has only begun. The integration model and the cycle of planning, acting, observing and reflecting will strengthen and increase the model’s flexibility for adaption and infiltration into further fields of accounting education.
The structure and composition of the integration model and the PSI will be further discussed in the Chapter 4. The design of this study is based on DBR and I contend that the iterative cycles of authentication and verification were intrinsic to the guide and map for this study’s journey.

2.4 RESEARCH DESIGN AND THE FIT OF DESIGN-BASED RESEARCH

In order to conduct research it is necessary to have a solid research design, and this study employs the research cycle of Leedy (1997, pp.5-10). In this view, research is seen as cyclical, that is a series of events or operations repeated in a certain order, not as closed circles of events but rather a spiral process of research (Leedy, 1997). It is important to appreciate each part of the cycle as well as being able to work with the process as a unified whole. The phases are sequential, each linked together with a feedback cycle, as evident in the process of DBR (Coghlan & Brannick, 2005). The iterative cycles of DBR facilitated the authentication and refinement of data as each cycle redefined and informed the next phase. Each of the four feedback cycles redefined and informed the next phase, as well as themselves being refined and validated as the study progressed.

This study was initially conceived as design–based research only after an extended period of focusing on the processes of action research. One of the focal features of DBR is the need to refine and inform the design through a cyclical and iterative process (Amiel & Reeves, 2008; Bannan-Ritland, 2003; Barab & Arici 2005; Barab & Squire, 2004; Design Based Research Collective, 2003; Edelson, 2002; Hakkarainen, 2009; Kelly, 2003; Reeves, Herrington & Oliver, 2005; Wang & Hannafin, 2005). Upon reflecting on the design of the PSIs for this study, I immediately started to focus more on the principles of DBR rather than those proposed by action researchers. There are four phases and four cycles in this design (see Figure 2.5, on page 49) with each cycle facilitating the refinement or validation of each of these four stages of the plan for implementation.
The cycle commences in phase 1 with a clear unambiguous statement of the problem and specific plan of procedure. A clear statement of intention is necessary for the success of the research (Badenhorst, 2008; Edelson, 2002; Henning et al., 2004; Hofstee, 2006; Leedy, 1997). The overall research effort must be planned and the design must be in a logical sequence, together acting as a guide or map to the research goal. Research divides the problem into sub-problems, and the questions or problems guide the whole research process (Badenhorst, 2008; Greyling, 2007; Mouton, 1996). By seeking resolution to these sub-problems or questions the main question will be resolved through the collection of data. There are different ways to collect the data and each should be appropriate for the type of research. The data collection is part of phase 1 of the cycles of events and the cycle continues through the process of data analysis and interpretation.

It is important that the process of data analysis and interpretation, which is in phase 2 and 3 of this study, must be thorough and carefully undertaken (Leedy, 1997). The final stage or the completion of the cycle is to ensure the questions and the supporting sub questions provide a solution to the research problem. The resolution of the problem or the tentative answer to the question completes the cycle. Leedy (1997) argues that viewing the research in this cyclical way is to invest in its dynamic quality and that research is not static or self-contained. It is like a spiral; in researching one area other problems may be highlighted that need resolving (Leedy, 1997). The cyclical nature of research is embedded in DBR which can easily be used in a qualitative study of this nature (Amiel & Reeves, 2008; Reeves, 2000).

2.5 THE CHARACTERISTICS OF DESIGN-BASED RESEARCH PERTINENT TO THIS INQUIRY

An emerging methodology that supports both qualitative and quantitative studies in education (Barab & Squire, 2004; Kelly, 2003; Design Based Research Collective, 2003), DBR accommodates more than descriptive accounts of a phenomenon or confirmation of arguments. It also facilitates active and innovative research in education (Kelly, 2003). Greyling (2007) used DBR to provide
guidelines for the implementation of her intervention, which was a professional development programme to support higher education practitioners in their use of educational technologies for teaching innovation. Greyling (2007, p.38) claimed that DBR steered her study on its journey to the research goal and pulled together the aims of interpretivism, critical theory and social constructivism for her to better understand the elements of educational transformation. In this study, DBR presents the essential elements as a way of closing the gap between accounting education, accounting practice and ICT, enabling me to address the methodological issue of "goodness of fit" (Creswell, 1994; Denzin & Lincoln, 2003; Henning et al., 2004; Merriam, 2009).

Characteristics of DBR have been described by various researchers (Amiel & Reeves, 2008; Bannan-Ritland, 2003; Barab & Arici 2005; Barab & Squire, 2004; Design Based Research Collective, 2003; Edelson, 2002; Hakkarainen, 2009; Kelly, 2003; Reeves, Herrington & Oliver, 2005; Wang & Hannafin, 2005). I have categorised and summarised nine essential components of DBR relevant to this study and discuss their supportive, verification and validating roles in the process of closing the gap in accounting education and accounting practice, the integration model, the PSI and practical implementation below.

Firstly, DBR facilitates the confluence of a series of approaches with the intention of effecting change, implemented through new theories, artefacts and practices to potentially impact learning and teaching in its naturalistic context. At the heart of this methodology are the design and the ecology of learning, with both the pragmatic and theoretical orientation being evident (Cobb et al., 2003). Also emphasised is the iterative, interventionist, innovative, design-based and theory-orientated characteristics. Specifically referred to is the pragmatic orientation, in which the theories developed “do real work in practical educational contexts” (Cobb et al., 2003, p.13). The PSI and the integration model are at the convergence of the cycles of refinement for the changes in the department of Commercial Accounting. These new designs for the integration of accounting education and ICT will potentially change the teaching and learning of accounting education to incorporate the skills needed in accounting practice. The designs considered both the practical and theoretical implications of teaching and learning
to have the maximum potential to effect change. The *iterative, interventionist, innovative, design-based and theory-orientated characteristics* of DBR were needed to shape and model the designs.

Secondly, DBR involves real–life settings, in which most learning actually occurs. The PSI is designed to facilitate a learning experience for the lecturers teaching the diploma students within the UJ context. This real-life setting, coupled with a synergy of skills and experience, provides the greatest potential for learning.

Thirdly, DBR involves multiple dependent variables. In the three environments of accounting, education and ICT, the resulting multiple variables needed to be considered in a holistic and interactive stance in the design of the integration model and the PSI. This was imperative for a potential pragmatic implementation and integration across these three disciplines. I argue that the iterative cycles of DBR facilitated the consideration of these multiple variables.

Fourthly, DBR focuses on characterising the situation in all its complexity. In the design of the PSI it is necessary to include all practical considerations which characterise the situation in the Commercial Accounting department for the implementation to be effective. In the design of the integration model and the PSI, four iterative cycles were identified which enabled the consideration of these three disciplines to be aligned for a potential integration process to take place.

In regards to the fifth characteristic, the DBR cycles involve flexible design revisions through rigorous and reflective inquiry to test and refine innovative learning environments. Of the four cycles that facilitate the refinement of the PSI and the integration model the first is the focus groups and the interviews together with all the literature and the examination of the accounting practice and ICT worlds that relate to this study. The second cycle is the refinement of the developments through the feedback forms from the staff buy-in workshop. The third cycle is the further refinement from the staff orientation PSI workshop and the final is the validation cycle, in which all these processes converge to the validation of the design of the PSI and the integration models.

Complex social interactions have been identified as the sixth characteristic in DBR, which I believe was a crucial component in the design of the study. It was
imperative that in this change process the staff buy-in was always evident. The support of the management of UJ was necessary for the process to be implemented and the partnership with industry was a critical aspect in the process of the design of the PSI. The social interaction of the staff, management and industry is evident from the first to the final phase of these iterative cycles.

The seventh characteristic involves looking at multiple aspects of the design and developing a profile that characterises it in practice, thereby creating a bridge between universities and practitioners and increasing the potential impact and value of educational research. Although set in the naturalistic context of the Commercial Accounting department for the diploma students, it is not context-bound and I contend that the PSI and the integration model designs could be adopted and adapted in other accounting educational settings. The involvement of the staff of the department was an imperative design feature facilitated by the sixth characteristic of DBR.

The intensive collaboration among researchers and practitioners promulgated by the eighth characteristic is evident in the design of the PSI. It is an imperative that the teaching and learning experiences of the lecturers in the Commercial Accounting department was considered in the developmental phase, hence the focus groups, the staff buy-in workshop and the orientation workshop involved the staff of the Commercial Accounting department and practitioners from industry.

Lastly, the ninth characteristic involves a commitment to sharable theory construction and explanation while solving real-world problems. The theory is believed to have ecological validity as it is set in real-world practice. I believe the teaching and learning theories developed will serve the greater educational community while solving the real problem of a lack of integration and under-skilled graduates. The element of complex social interactions, being the sixth component, was considered during the analysis of the data with the use of Engeström’s activity theory as an analytical tool within the framework of Cultural Historical Activity Theory (CHAT).

These summarised characteristics are evidence that the possibilities of reform through the methodology of DBR are an important aspect in any study. The
Design Based Research Collective (2003, p.8) iterates four prospects of DBR in education, as reproduced in italics below. The four areas in which I see DBR as having the most promise in the reform of accounting education are as follows:

1. **Exploring possibilities for novel learning and teaching environments.** DBR has provided an opportunity to understand the real-world demand on the evolution needed in accounting education and that placed on the novel design of the PSI to increase the potential of successful implementation.

2. **Developing contextualised theories of learning and teaching.** DBR is argued to be of value in addressing research relating to the optimal design features of the PSI, which is aimed at being the enactment of the interventions to close the gap in accounting education and accounting practice.

3. **Constructing cumulative design knowledge.** In my opinion, DBR will lead to an understanding of relevant design knowledge set in the naturalistic context of the accounting education of the diploma students. I do however believe that this knowledge is sharable, will contribute to design knowledge theories and link these theories to applied understandings in other contexts for the advancement of accounting education.

4. **Increasing human capacity for innovation.** The design of the interventions and DBR has already provided opportunities for the exchange of expertise across disciplines. I believe that there will be opportunities for further innovation and new analytical techniques in the dynamic fields of education, technology and accounting practice.

I therefore consider that the reform of practice in accounting education can be facilitated through DBR.

### 2.6 THE DESIGN PHASES OF THIS STUDY

Changing the face of accounting education may be set in motion with DBR facilitating the planning, the design, and the engineering of the four stages of the implementation plan. DBR has already been identified as an especially powerful methodology to support innovations and evolving theories within real-world
contexts (Barab & Arici, 2005). This process necessitates a global vision, incorporating the understanding of teaching and learning, the individual, the participation of the learner, and the vigorous environments in which accounting education is set (Design Based Research Collective, 2003). The design of this inquiry is suited to the complex real-world context of accounting education in which I as researcher have developmental goals that are focused on solving teaching and learning problems guided by theoretical design principles. These developmental goals aim at building a stronger connection between educational research and the real-world problem (Amiel & Reeves, 2008; Reeves, 2000; compare Edelson, 2002, p.106) of inadequately prepared accounting graduates. The DBR in this inquiry is conducted over four phases, the intention of each being to contribute to the goal of closing the gap between accounting education, education, and ICTs.

The DBR basic iterative design that Reeves (2000) and Amiel and Reeves (2008) proposed as development research included four phases. The first phase was the analysis of the practical problem in collaboration with practitioners. The analysis of the practical problem was conducted primarily by means of focus groups and an interview. The second phase was a commitment of the researchers to develop the solution to the practical problem within a theoretical framework. The development of the four stages of the implementation plan was carried out within a theoretical framework of CHAT. The third phase was called the evaluation and testing phase and was facilitated through a series of workshops to evaluate the programme. The fourth and final phase was documentation to produce the design principles. The validation of the PSI and the integration model incorporated feedback for implementation. Each phase was linked to the previous and subsequent phase in a cycle of refinement in order for the solution to be the best possible one set in context of the practical problems analysed in the first phase. This design has been adopted and adapted for this study. In Figure 2.3 (below), the four phases and their original purpose and cyclical nature as conceptualised by Reeves (2000) and Amiel and Reeves (2008) are evident.
The four main phases provide a directional map from problem identification to verification and documentation of the PSI and integration model. The phases are sequential and each is linked with a cycle of informing the next, as well as itself being refined and validated as the study progresses. The above design was further adapted into an expanded design logic for this study and Figure 2.4 below depicts the expanded design logic.
The first phase was the analysis of a practical problem in collaboration with practitioners, which was adapted as the phase of data collection and analysis of practical problems, which included a needs analysis by means of focus groups and interviews. This phase was primarily a data collection phase from three main sources: my colleagues who are lecturers in the department of Commercial Accounting by means of two focus groups; an interview with a lecturer in ICT at UJ; and various interviews with an accounting software practitioner in industry. Phase 1 was the primary source of information that fed the development of the designs in phase 2 and has been termed ‘the substantiation cycle’ as my claims
and ideas needed confirmation. The data from phase 1 was analysed and filtered within a theoretical framework of CHAT.

The data collected from phase 1, together with my claims and ideas from the PICs was used in the second developmental phase, which Amiel and Reeves (2008) set as a commitment of the researchers to develop the solution to the practical problem within a theoretical framework. The second phase for this enquiry was to design and develop the four stages of the implementation plan, which consisted of, inter alia, an integration model through which the PSI operated using mainly the convergence of data collected in phase one combined with relevant literature. It was necessary first to verify and validate the gap in accounting education, then to develop the PSI and integration model. CHAT, as a thinking tool, assisted in the clarification of the design principles of the PSI. CHAT was also instrumental in the identification and classification of possible practical implementation tensions within the activity system of the department of Commercial Accounting.

The third phase of Amiel and Reeves (2008) basic iterative design was called ‘the evaluation and testing phase’, in which a series of staff evaluation workshops were conducted. The purpose of the third phase was firstly to get the staff to buy into the process of accounting education reform. This was done firstly by highlighting and verifying the gap in accounting education, secondly by presenting and clarifying the features of the proposed integration model. Finally, it was necessary for the staff to accept and embrace the need to re-skill through the PSI. This was conducted as a staff workshop in which feedback forms were analysed, including ones on their needs for the PSI.

The second set of workshops in the third phase was termed ‘gateway workshops’, which provided two main avenues for the verification and validation of the integration model. The first avenue provided by these was for the alignment, restructuring and modification of the curriculum of the Diploma in Accountancy. This reform of the curriculum was necessary for the integration of ICT and accounting education. The curriculum changes were proposed in the staff buy-in workshop and later effected for implementation in 2011. The other opportunity or avenue provided by the gateway workshops was for the supplier of
the accounting software, *Pastel*, together with the management and staff of the Commercial Accounting department, to support the development of the PSI and the integration model.

The third set of gateway workshops also provided a means of informing and refining the PSI principles before the staff orientation workshop. The third staff workshop was an orientation programme for the PSI and the feedback forms provided a final evaluation and refinement of the PSI. CHAT as a thinking tool and for the analysis of the data has been instrumental in refining and validating the feedback into the design of the integration model and the PSI.

The fourth and final phase was the documentation phase, to validate the integration model and implementation of both the model and the PSI. Each phase was linked to the previous and subsequent phase in iterative cycles of refinement in order for the solution to be the best possible one set in context of the practical problems analysed in the first phase. This design has been adopted and adapted as the iterative cycles increase the potential for rigorous and disciplined construction of this process of change, as well as the possibility of sound evidence (Babbie & Mouton, 2001). However, as depicted in Figure 2.4 (above), the four phases and their original purpose and cyclical nature as originally conceptualised by Reeves (2000) are evident in this enquiry. The four main phases provided a map for the journey from problem identification to verification and documentation. The phases are sequential with cycles informing the next phase through a procedure that I have termed ‘a CHAT filtering and refinement process’. At this point I clarify how CHAT was infused in the design logic.

The influence of CHAT as a thinking tool and for the analysis of the data in each of the four cycles of DBR supported the design and development of the PSI and the integration model. The four cycles of DBR are distinct from the design phases and provide an avenue for feedback to refine and develop the PSI and the integration model. Each cycle of feedback is filtered through the theoretical framework of CHAT. Each feedback cycle of refinement was analysed, coded and matched to Engeström’s (1999, p. 1) activity theory system. An outline of the design phases and cycles are depicted in Figure 2.5 (below).
2.7 CHAT AS A THEORETICAL FRAMEWORK

Roth and Lee (2007) show that over a period of 30 years, from 1975 to 2005, the interest in CHAT grew at a steady pace. However, the increase over the five-year period from 2000 to the last quarter of 2005 accounted for approximately 45% of the total increase. CHAT has been identified as an “integral road map for educational research and practice” and as an evolving theoretical framework. It has been demonstrated as having the most “profound potential … to overcome problems” in educational theory and practice (Roth & Lee, 2007, p. 186), and “a practice orientated psychology suited to solve real-life problems” confirms its flexibility (Stetsenko & Arievitch, 2004, p. 481). CHAT has been cited as versatile and as a practical theory that has enabled the enrichment of complex, changing forms of collaborative human activity (Foot, 2001). It has become known as a versatile and accommodating framework and meta-theory (Roth & Lee, 2007), whilst Brown and Cole (2008, p.226) maintain that they used it to guide the design and implementation of educational activities, “… as an object of research and as a guide to practice” (Brown & Cole, 2008, p. 226). For Koschmann (2008), CHAT is all supportive, especially as a framework on which to build a relative new field, and it also provides a “framework for describing the structure, development
and context of computer-supported activities” (Nationall Forskaraskola i Kognitionsvetenskap, 2010, p. 1).

Interaction design has been cited as important for contemporary society, and Koschmann (2008, p.361) maintains that one needs to understand human engagement with digital technology and then to use that understanding to better design more useful and pleasing artifacts. Use-Design (2009), on their web site, explain that interaction design aims to define and facilitate interaction between humans by means of a product or a service. Using ICT, interaction design relies heavily on material gathered during human observation for re-design of a more effective and pleasing artifact (Use-Design, 2009). Interaction design is not an integral part of this study as the PSI and integration models are an innovation in the field of accounting education, however, interaction design should be considered after the implementation phase to increase the effectiveness of this study’s artifacts in the integration of ICT and accounting education. This distinct possibility will be further investigated in the recommendations in Chapter 6.

An investigation of CHAT is incomplete without a brief exposition of its history, and in the next section its development is presented.

2.8 THE DEVELOPMENT OF CHAT

Cultural-historical theory was developed by Vygotsky, Leont’ev and Luria between 1920 and 1930 (Engeström, 1999a; Engeström & Miettinen, 1999; Stetsenko & Arievitch, 2004). Vygotsky also created what is known as ‘first generation activity theory’, which was further developed by his students and colleagues, Leont’ev and Luria (NGRF, 2007; Roth & Lee, 2007), although “the differences between cultural-historical theory psychology and activity theory are so subtle that both theories are often combined and referred to as CHAT, Cultural-Historical Activity Theory” (Littlejohn, 2007, p. 6).

Vygotsky (1896-1934), drawing on Marx, German classical philosophy and existing currents of psychology is known as the founder of CHAT (Blunden, 2009). Luria (1902-1977) and Leont’ev (1903-1979) were his colleagues, with Luria bringing knowledge of medicine and psychoanalysis to Vygotsky’s school
and developing the foundations of modern neuroscience. Leont’ev addressed the
problem of the origin of social motivation for actions and founded Activity Theory

Engeström and Miettinen, (1999, p.2) were instrumental in defining and conceptualising the activity theory framework, and revealed:

> “its rich texture to the western scientific community…and such parallels and hybrids make the implications and potentials of activity theory more accessible in multiple fields of research and practice without compromise to the common conceptual and methodological core.”

The development of an individual’s learning and knowing is influenced by one’s life histories and culture (Colucci, 1999), and cultural-historical theory was further developed and become an integral part of what is known as ‘activity theory’ (Engeström & Miettinen, 1999), hence the widely accepted term ‘cultural-historical activity theory’ or CHAT.

Two broad areas that directly impact this study are teaching and learning and human-computer interaction (Engeström & Miettinen, 1999; Miettinen 1999; Roth & Lee, 2007). Central to activity theory and therefore to CHAT is Vygotsky’s, Leont’ev and Luria’s holistic and integrated work in learning and knowing (Roth & Lee, 2007). The conceptualization of the genealogy of CHAT in Figure 2.6 (below), by Blunden (2009), highlights the relevant philosophies that shaped Vygotsky’s theories, the predominant persuasions of which were Hegel and Marx (Axel, 1997; Blunden, 2009; Gredler, 2009; Schütz, 2004). Blunden (2009) maintains that Hegel (1770-1831) was the founder of Cultural Psychology and that Marx (1818-1883) used Hegel's idealistic philosophy. Marx’s critique of the political economy was a model for Vygotsky’s psychology and Marx created the philosophical and ethical foundations of CHAT.
The historical approach does not mean that historical situations become the object of analysis or that historical context is core to scientific analysis. It aids scientific understanding if researchers study the beginning or ‘genesis’ of the unit of analysis (Colucci, 1999). Human social-semiotic systems have evolved over time and continue to transform over the generations (Thorne, 2004). Historical content and organization of a human conscious is seen as a result of earlier experience which has accumulated and developed in the society of one’s culture (Axel, 1997). These accumulations and developments are also seen as ‘open ended statements of human potentials’ and can only be determined by identifying the life histories set in particular socio-cultural forms of living (Axel, 1997). The mastery of one’s potential in thinking has meant the development of a series of
artificial stimuli and signs that differ across historical periods and cultures (Gredler, 2009). Gredler (2009, p.3) claims that “Culture manifests itself through society’s criteria for semantic and logical operations” (Gredler, 2009, p. 3) and is conveyed through its linguistic system. These signs, as well as the use of tools, have developed over history as humans have developed higher forms of thinking (Gredler, 2009). Welk (2006) maintains that in CHAT the formation of cognition is constructed within a social interaction setting as long as the social interaction is grounded in the relevant culture and history of the student.

Human beings are social beings and therefore history and culture influence human nature and their individuality (Robertson, Fluck & Webb, 2010). Axel (1997) cites Leont’ev to emphasise that human nature and individuality is based on social activity, which was also a cornerstone of Vygotsky’s theory. The development of consciousness, which includes thinking, feeling and will (Gredler, 2009), and the potential to further that ability to perceive, think and remember, is linked to cultural-historical social activity (Axel, 1997; Meyers, 2007). The interweaving of the influences of these elements, history, culture and activity, forms the basis of the cultural-historical activity theory conceived by Vygotsky and further developed by Leont’ev and Luria. It continues to be relevant as a theoretical framework in many studies nearly a century after conception (Roth & Lee, 2007). Vygotsky’s theories and education are integrated to the extent that it is necessary and relevant to consider them in this study.

2.9 VYGOTSKY’S THEORIES

It is difficult to exclude Lev Vygotsky (1896-1934) from any serious discussions of learning processes (Schütz, 2004), and his studies among others include the following areas: origins of thought and language, word meaning and concept formation, social constructivism, thought language and intellectual development and the zone of proximal development (Blunden, 2009; Foot, 2001; Gredler, 2009; Robertson, Fluck, & Webb, 2010; Schütz, 2004). Vygotsky started to work on areas of developmental psychology, education and psychopathology in 1924 (Schütz, 2004), but it was only after the cold war in the late 1970s and 1980s that interest began growing in his work in the western scientific community.
(Engeström & Miettinen, 1999; Schütz, 2004). Probably the most recognised of Vygotsky’s theories is the Zone of Proximal Development (ZPD) (Gredler, 2009).

ZPD revolves around understanding intellectual development, and Vygotsky (1978) maintained that a clear understanding of the interrelations between thought and language is necessary for the understanding of intellectual development (Schütz, 2004). He did not deny that a person’s intellectual ability passes through development phases but rather emphasised that learning takes place in the ZPD, which is the difference between the student's capacity to solve problems independently and the capacity to do so only with assistance (Robertson, Fluck, & Webb, 2010; Schütz, 2004).

When we determine a person’s intellectual ability by using tests we are dealing with the actual development that has taken place through the internalisation process. These tests are indicative of functions that have already matured, that is, the end products of development. Schütz (2004, p.4) likens the ZPD to setting the timing of an engine slightly ahead of the highest compression in order to maximise performance. The ZPD facilitates the extension and potential of a student’s performance. The actual developed level refers to all the functions and activities that a student can perform without assistance, whereas the ZPD represents those intellectual functions that have not yet matured and are in the process of developing and would therefore include all functions and activities that students can perform only with the assistance of someone else. The person providing assistance or non-intrusive intervention could be the educator or a peer who has already mastered that particular function (Schütz, 2004).

Vygotsky (1978) proposed a non-intrusive intervention or assistance, which entails educators offering clues, helping with guiding questions, or showing how the problem is to be solved and the person then solves it. This has become known as ‘scaffolding’. The term scaffolding was introduced by Wood, Bruner and Ross in 1976, and is widely used. They may initiate the solution and the person completes it, or the person solves the problem in collaboration with others, then the way the person arrives at the solution is indicative of his or her mental potential (Schütz, 2004). The potential values of scaffolding are the increases in the rate of learning, the expansion of possible learning activities and experiences.
making it easier for the student to undertake tasks successfully (Robertson, Fluck, & Webb, 2010). This means that a person’s ZPD tells us about intellectual functions that are maturing through a process of internalisation. According to Vygotsky (1978), an essential feature of learning is that it stimulates an internal developmental process (Schütz, 2004) which assists in the development of higher forms of thinking (Gredler, 2009).

The process of internalisation could be seen as taking ownership of the knowledge transacted through the assisted performance (Robertson, Fluck, & Webb, 2010). Vygotsky (1978) claimed that the essence of cognitive development is a complex reasoning or dialectical process whereby individuals transform their thinking to enable higher forms of thinking through the process of internalisation (Gredler, 2009). An understanding of external stimuli facilitated in the classroom is necessary to master internal cognitive processes.

Vygotsky (1978) maintained that the development of the internal process of one’s cognitive activity is linking and understanding the external stimuli (Roth, 2008) provided in a social activity (Gredler, 2009; Robertson, Fluck, & Webb, 2010; Schütz, 2004). In other words, learning is a socially constructed process from a social activity, or an external process, whereby internalisation is facilitated for the social construction of knowledge and learning (Cole, Engeström & Vasquez, 1997; Cole, 2007). Stetsenko and Arievitch (2004, p.489) quote Leont’ev to clarify that cognitive development is not an imprinting of external processes on an individual but rather a process whereby individuals construct knowledge for themselves in the internalization process.

The potential development level presupposes a specific social nature and a process in which a person grows into the intellectual life of those around. Learning is a cognitive function that occurs in a social setting in association with other people (Vygotsky, 1978), and according to Vygotsky (1978) all fundamental cognitive activities develop in a social matrix of associations, which is the theory of social constructivism.

In Vygotsky’s well-known work, *Thought and Language* (1962), he considered that the determining factor in a person’s psychological development is that
person’s social development, especially the development of language (Vygotsky, 1962). If a person’s language development is enhanced through social interaction then the acquisition of knowledge is gained within the social setting. Vygotsky’s (1978) theory of social constructivism emphasises the acquisition of knowledge in the context interaction with dialogue and shared understanding. The key therefore to psychological development, language development and understanding is social interaction.

Social constructivism emphasises the construction of personal knowledge, first in the social context, which is external before it is personalised or internalised. Intelligence begins in the social environment and directs itself inward, while learning is an operation that initially represents an external activity and is reconstructed and begins to occur internally. Therefore, learning is something that starts outside of us, in the society around us, and then is transferred within us. Intelligence does not begin in a person but rather in the relations between people and the world around us. Once these processes are internalised they become part of a person’s independent development. Interpersonal relations therefore play an important role in any teaching situation because teaching is nothing other than the social transaction of meaning. It is the social transaction, which is the driving force of education. Learning therefore is a process of development, which must be internalised (Vygotsky, 1978).

In this inquiry, the students will therefore need to be actively involved in the process of accepting and transforming their existing knowledge framework with new knowledge by making connections in an organised and structured manner to facilitate access (Gravett, 2001). The students will need to link new knowledge to existing knowledge in a structured manner to promote deep holistic learning. New knowledge, which is accepted, transforms and enriches existing knowledge or previous experiences, while new learning builds on previous knowledge through a process of linking or connecting with existing knowledge, which is thus transformed and enriched. Meaningful learning occurs when new knowledge connects or links to existing knowledge in an organised and structured way (Gravett, 2001). A personal interpretation (Rhodes, 2003) is given in Figure 2.7 (below), with a graphic depiction of the learning environment to foster the process.
of development. The circles represent the lecturers, who will be the learners in the PSI, learners in a structured social activity. This external stimulus facilitates the social transaction of meaning. This, according to Vygotsky (1978), is teaching which drives the process of learning development and the setting depicts social constructivism in which learning has the potential to develop. The construction of personal knowledge occurs first in the social context, which is external before it is personalised or internalised (Vygotsky, 1978).

**Figure 2.7:** Learning as a process of development. (Rhodes 2003:21)

In the centre is the educator who has accumulated more knowledge than the lecturers and is therefore represented as a larger circle, therefore, the lecturers are depicted in smaller circles than that of the educator. The educator is also represented as a circle, showing that learning never stops for him or her and both the educator and lecturers are in a vibrant and dynamic pool of public knowledge. The participants are all able to draw from the public knowledge and give back to the pool their own personal experience and knowledge. Each circle has the same opportunity to grow through the ZPD, represented by the second outer circles.
Each circle grows when the learning content or public knowledge becomes internalised. The circle that is shown with no expansion is the lecturer who has not participated in the exchange of knowledge and therefore has not gained new knowledge. The lecturers will need to engage and participate in the structured activities for the facilitation of the internalisation of knowledge, which implies a voluntary engagement and is the self-mastery or self-discipline of one’s behaviour (Gredler, 2009).

Self-mastery is one of the outcomes of voluntary cognitive development, and as Gredler (2009, p.8) maintains, is an important outcome of cognitive development as it facilitates the other higher mental functions for learning to develop through a process of internalisation. The highest levels of self-mastery or mental functions are

“self-organised attention, categorical perception, thinking in concepts and logical memory. Categorical perception is a synthesis of concrete images and concept meanings. Conceptual thinking involves working with words and ideas and their interconnections” (Gredler, 2009, p. 8).

Self-mastery requires the individual’s active intervention to link or scaffold this new knowledge to existing knowledge. The connections need to be in an organised and structured manner (Gravett, 2001) to facilitate the re-construction of one’s thinking in concepts (Gredler, 2009). Gredler (2009, p.8) cites Vygotsky (1960) to summarise the centre of Vygotsky’s theories as three equivalent processes: cognitive development, the historical-cultural development of behaviour, and the self-mastery of behaviour through internal processes.

2.10 THE DEVELOPMENT OF ACTIVITY THEORY IN CHAT

The meditational triangle in Vygotsky (1978) reflects the elements of subject, object and mediator or tool. However, Hardman (2007) agrees with Engeström (1999) that this first generation activity theory is constrictive in its use as an analytical framework as it does not allow for the collective and dynamic nature of activities. Vygotsky did not emphasise the notion of practical activity or how cognitive changes occur in a collective environment (Hardman, 2007).
Lautenbach (2005 p.103) clarifies that the relationship between the subject and the object is not always direct but connects indirectly through the use of tools and signs, hence the broken dotted line in first generation activity theory depicted in Figure 2.8 (page 62). This model is also referred to as the ‘first generation activity theory model’. Hardman (2007) concurs with Lautenbach (2005) and highlights the notion that Vygotsky promoted elementary cognitive functioning at the base of the triangle and the higher cognitive functions are developed though the median of tools and signs. Hardman (2007, p.113) maintains that Vygotsky’s triadic model restricts its use as an analytical framework in “situating learning within a wider context, accounting for the collective and dynamic nature of activities”.

Leont’ev incorporated social, cultural and historic elements into the explanations of human mental functions (Hardman, 2007), believing that practical activity is the impetus for cognitive development and not semiotic mediation as promoted by Vygotsky. There is support for both Vygotsky’s role of semiotic mediation and for Leont’ev’s emphasis on activity theory, but this discrepancy is probably because the systematic structure of activity was not properly analysed (Engeström, 1999). Leont’ev placed these activities within social activities and made the distinction between individual actions and collective activities (Hardman, 2007).

Engeström (1999) maintains that Leont’ev did not develop the basic triadic model to depict the structure of the collective activity environment, whilst Hardman (2007) clarifies that the object of activity for Leont’ev was individual and the studying of the object of an activity is therefore the understanding of motivational forces that influence the activity of the individual (Hardman, 2007). Although Vygotsky formulated the element of practical human labour activity, Leont’ev made the unit of analysis the object-practical activity which was used to explain the principle that “determines genesis, structure and contents” of the human mind (Roth & Lee, 2007, p. 189). Koschmann (2008) quotes Leont’ev’s on object-directed activity in CHAT, whereby an activity is directed at a certain object, that an objectless activity is impossible and that a researcher using CHAT should appreciate the importance of the concept of object-related activity (Koschmann, 2008). The object and the activity are key features in Leont’ev’s second generation activity theory (Figure 2.8, page 63). Engeström (1999, p.23)
maintains that “Leont’ev’s three-level scheme extends the sphere of analysis and directs attention to the transformation between the levels. However, merely proclaiming that activity is a superior unit of analysis does not help”. Engeström (1999) explains that the activities need to be considered within their historical and cultural environments.

Roth and Lee (2007) support this notion and highlight the link between the three levels. An activity occurs because of real and tangible actions which are directed and driven by goals that are framed by individuals. In human consciousness, and in CHAT, the actions and the goals are the dominant features during active engagement with the world (Roth & Lee, 2007, p. 202). Human consciousness is governed by the sense and the meaning we make of our world, which is embodied in our own cultural-historical environments. Roth and Lee (2007) explain that the operation is not shaped by the goal but emerges in response to the action in its material context or conditions surrounding the action. Sequences of operations constitute one action and the condition under which an action is taken is linked to our cultural-historical environments. Therefore, Roth and Lee (2007) support the interweaving of CHAT as a framework for analysis of human behaviour and cognitive development. The second generation activity theory that Roth and Lee maintain is widely used for analysing an activity system is reflected in Figure 2.8 (below), however, the conceptualisation of the activity system is attributed to Yrjö Engeström.

Engeström’s (1999, p.28) objectives were to conceptualise and construct a model that would:

- incorporate the concept of mediation through tools and signs
- reflect the dynamic relations of an activity system
- incorporate the historicity and developmental judgment of human activity and still account for the diverse and numerous features inherent in human activity
- incorporate a practical methodology that could bridge the gap between the basic and the applied, between the conceptualization and the intervention.
Foot (2001, p.7) cited Engeström, Cole and other theorists who agreed that activity theory is intensely contextual and focuses on understanding historical impacts on objects, mediating artefacts and social organisations, that it focuses on cognitive development and is a developmental theory that “seeks to explain and influence qualitative changes in human practices over time.” Engeström (1999, p.28) conceptualised a whole system and yet was able to identify six parts of the whole as separate integral parts belonging to one system, so aptly termed, an activity system (Figure 2.8, below). The six parts identified are the subject, the object and its transformation to the outcome, the mediating artefacts, rules, community and division of labour. The parts are separate and identifiable with conflicting and contradictory tensions as connectors. However, the parts are still part of one system.

Engeström (1999, p.28) conceptualised the activity system as a whole but consisting of six parts or subdivisions, which he called the “six dichotomies”. ‘Dichotomy’ is defined as a splitting of the whole into divisions, contradicting and conflicting, with nothing able to belong to one or other part and yet everything must belong to one whole unit (Dictionary.net accessed May 2010 from http://www.dictionary.net/dichotomy). Therefore, the description of the six parts fit well as six dichotomies, each part identifiable as playing an important role in a complete system, and yet the relationships between them are often conflicting and often described as tensions or contradictions in the activity system. Lautenbach (2005, p.109, citing Barab et al., 2002) highlights the importance of these contradictions. Such tensions are often what motivates and drives specific actions (Núñez, 2009) in the different components and are crucial in the understanding of an activity system that is dynamic and evolving (Murphy & Rodriguez-Manzanares, 2008). This notion is supported in an activity theory study carried out on contradictions and the socio-cultural dimensions of collaboration (Basharina, 2007).

The contradictions are said to serve as “springboards for changing activity systems” (Meyers, 2007, p. 5), and are positive forces for they ensure a better understanding of activities within the system (Brown & Cole, 2008; Lautenbach, 2005). Lautenbach (2005) explains that the analysis of individual actions as well
as the activities of the system as a whole may reveal new contradictions. These revelations will then assist in understanding the individual activities as well as, in a broader context, the activities of the system under analysis. Engeström (1999, p.31) found a place in his own conceptualisation of the activity system theory for positive contradictions, expecting the activity theory model to “evoke objections and criticism...if so, the model is serving its purpose”. Engeström’s (1999) identified the notion of expansive cycles to incorporate historicity into activity theory.

Figure 2.8: Depiction of the development of activity theory concepts from first generation to third generation activity theory
Roth and Lee (2007, p.197) confirmed that the second generation activity theory has the six elements of Engeström’s (1999) activity system, as well as another set of “higher order processes of production, exchange, distribution and consumption” (refer to Figure 2.8 above). They linked the four higher order processes as follows:

- The subject is linked to the object and therefore also the outcome. The link is called ‘the process of production’. Actions produce resources which lead to the outcome and the subjects’ activities and actions produce the outcomes. Engeström (1999, p.30) used his own goal of writing the text on the central issues of activity theory as an example. His activities, as the subject, centred on the issues of activity theory (object) to produce the text, which is the outcome.
- Engeström’s (1999, p.30) actions produced resources that fed back into the system which was used in a process of consumption to further refine the text. Consumption is the opposite of production and all outcomes of productive activity are consumed.
- The subjects link to the community through a process of exchange, which depicts the relationship of the subject with the community. Engeström (1999, p.30) identified his colleagues as his community and through a process of exchange of his text on activity theory inspired his colleagues.
- The objects are also linked to the community through a process of distribution. The objects which have accumulated within society are distributed. Engeström’s distribution process was the sharing of central issues of activity theory among his community.

Roth and Lee (2007) added value with their interpretations of Engeström’s links between the elements of subject, object and community, also introducing the concept of a third generation of activity theory. They maintain that all activity systems are part of a network of activity systems (Figure 2.8 above), a development in activity theory that is supported by what has been termed ‘the third generation of activity theory’. The network of activity systems is a true reflection of human society which has an interwoven historical process of ‘job diversification and collective division of labour’. The second generation activity
theory has evolved to reflect the vast diversity, complexities and dynamics of the present society. ICT and the rapid rate of dynamic change and evolution within ICT’s use in most spheres of society have called for a more dynamic and vibrant fit of activity theory. Roth and Lee (2007, p.200) would maintain that as a researcher who has adopted third generation activity theory I need to emphasise the importance of “the role of the dialogue, multiple perspectives and issues of power when dealing with interacting activity systems as networks”. They also claim that CHAT is one of the best kept secrets in the academic world, as it has the potential to overcome “dualisms in education [such as] individual versus collective and subject versus object and theory versus practice”. Due to the recognition by CHAT of the tension and contradictions within an activity system, Roth and Lee (2007, p.218), write that it compels researchers to “update, transform, and renew constantly so that the subject becomes a reflection of the object”. The next section will highlight how CHAT was supported in this study, how it has been infused in the study, and its practical implications for this study.

2.11 THE INFUSION OF CHAT IN THIS STUDY

CHAT is based on a “complex system of actions, tools, members, rules and a community” (Engeström, 1999, p.31), key features that were applicable to the integration of accounting education and practice in this study. The activity system as conceptualised by him recognises all the interlocking forces and relationships that were accounted for in this research. The activity system in this enquiry was initially based in the department of Commercial Accounting for the accounting diploma qualification, where my colleagues (the subjects) engaged with the integration programme (the object of the activity) through activity mediated by ICT (the tool) for the transformation of their skills and knowledge in accounting practice (the outcome), thereby reforming educational practice in the teaching of accounting in the diploma qualification. The community comprised all the stakeholders affected, such as employers in industry. The rules and division were, for example, the faculty regulations and the management of the department.
This was a third generation activity theory study as four associated and interconnected activity systems were identified and the first activity system (Figure 2.9, below) was the current system of accounting education of the diploma students in the department of Commercial Accounting at UJ. There was no accounting software (*Pastel*) integrated in the teaching and learning for the accounting diploma students, therefore the unit of analysis in all activity systems that are depicted below comprised the lecturers in the diploma programme in the Commercial Accounting Department who integrated and transformed their skills and knowledge, their epistemologies and pedagogies in accounting education.

![Diagram](image)

*Figure 2.9: A – Current activity system of accounting diploma students.*

Adapted from Engeström (1999:31)

The second activity system (Figure 2.10, below) was the basis of the study and the transformation of accounting education through the integration model and the PSI led to a new activity system. The tools were the computers, the integration model, *Pastel*, and *Pastel* manuals and accounting textbooks. The transformation
process with an integration of accounting software transformed the epistemologies and pedagogies of the accounting lecturers.

**Figure 2.10:** B – Activity system for the integration of ICT and accounting education for the lecturers in the accounting diploma.

*Adapted from Engeström (1999:31)*

Referring to the activity system B in Figure 2.10 (above), this enquiry was initially based in the accounting diploma qualification where my colleagues (the subjects) engaged through the PSI for the integration of accounting education with ICT (the object), through activities and using as tools the Pastel accounting software, accounting textbooks and the Pastel manual. The aim of the activities was to engage with tools to achieve an outcome. It was imperative that the tool did not replace the object. The tool mediated the activities to achieve the object which was ultimately to achieve the outcome, which was the transformation and integration of the lecturers’ skills and knowledge in accounting practice. In my opinion, this will potentially lead to the reforming of accounting education (the
outcome) in the teaching of accounting to the diploma students (the community) within the parameters of our faculty (the rules and division of labour).

The lecturers then engaged with the integration model to transform their epistemologies and pedagogies, thereby potentially closing the gap in accounting education and accounting practice (Figure 2.11, below).

![Activity system for the integration of ICT and accounting education for the students in the accounting diploma.](image)

*Figure 2.11:* C – Activity system for the integration of ICT and accounting education for the students in the accounting diploma.

*Adapted from Engeström (1999:31)*

In Figure 2.11 (above) the accounting graduates will potentially be better skilled as there has been a transformation in the pedagogy with the integration of *Pastel*.

### 2.12 THE DEVELOPMENT OF DESIGN PRINCIPLES

Lumsdaine and Binks (2007) maintain that staff members are more able to cope with change if they perceive it as an opportunity to foster self-development,
growth and new beginnings: “Personal and organisation change helps us survive and succeed in a rapidly changing world” (Lumsdaine & Binks, 2007, p. 173). The change process needed to be presented as an opportunity to succeed in a rapidly changing technological accounting industry. The interventions were presented to the staff as a requirement for the own personal self-development and growth as well as an opportunity to better skill the diploma accounting graduates for the workplace. I believe that the staff buy-in to the process of change was supported by evidence of research. It was necessary to maintain the enthusiasm of the staff in the orientation workshop by presenting guidelines for the training interventions. These design principles or guidelines were researched and presented to the staff as ‘tried and tested’ intervention design principles.

Greyling (2007) describes critical design principles for the construction of her professional development interventions, maintaining that collaborative learning is facilitated in a safe and supportive environment in which the learners are actively involved in the learning process. Learning experiences need to be centred on authentic and real-life activities for the usefulness in the real world to be understood (Greyling, 2007, pp. 95-107). Authentic activities, if allowed to have an impact on the educational design of learning activities, have been shown to have many benefits (Herrington, Oliver & Reeves, 2003). Ten broad characteristics of authentic activities were identified by Herrington, Oliver and Reeves (2003). Embedded in the design principles of the planned series of interventions presented in Chapter 5 are the characteristics of authentic activities. The staff members were assured that the interventions were designed and based on these ‘tried and tested’ principles and I maintain that it was necessary for the staff to maintain the vision, goals and direction of this study and thereby continue to support the change process. The training interventions and the integration model were designed to work together for the integration of accounting software skills and accounting education.

The integration model is based on accounting principles and concepts that are fundamental to and embedded in accounting software. I argue therefore that the integration model is sufficiently flexible to develop and embrace changes in technology and accounting software. Sloane and Gorard (2003), in their process
of model formulation and validation, maintain that there are design principles that are enhanced by the process of design-based research. The design principles of the four stages of the implementation plan of this study, as presented in Chapter 5, were refined and authenticated by the iterative cycles of design–based research (DBR). The DBR cycles promoted and facilitated the clarification of the design principles through a process of consultation, discussion and feedback.

2.13 CHAPTER SUMMARY

This chapter began by focussing on the qualitative nature of the study and the personal iterative cycles (PICs). The research design was then explored with a focus on the fit and characteristics of DBR. CHAT has been infused in the DBR design and its influence as an analysis and thinking tool was highlighted. The development of CHAT and the relevant theories of Vygotsky were presented. The development of activity theory and the infusion of CHAT were clarified and a conceptualisation and development of the design principles for the planned series of interventions were presented.

In the next chapter the research methodologies are discussed and the methodologies of data collection in the substantiation cycle by means of focus groups and interviews presented. The authentication and refinement cycles, including the three staff workshops, are discussed.
CHAPTER 3:
RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter focuses on the other data collection methodologies, namely the focus groups, the interview, the planned staff interventions (PSI), including the staff buy-in workshop, the staff gateway workshops and the staff orientation workshop. These data collection methodologies have provided feedback into design phase two as a process of refinement and validation of the four core elements of this study. Data collection through the use of focus groups facilitated the recording of data from a number of participants and observation of group interactions and developing dynamics (Lodico, Spaulding, & Voegtle, 2006, p. 121).

3.2 FOCUS GROUPS AND DATA COLLECTION

The broad definition that Barbour (2007) applies to focus groups is any group discussion where the researcher is attentive and encourages the group dynamics. A key feature is for the researcher to encourage discussion among the participants rather than their interacting only with the researcher (Kitzinger, 1994). Focus groups discussions are organised discussions that focus on specific issues (Barbour, 2007; Kitzinger, 1994), and for Gibbs (1997) they are organised discussions with a selected group of individuals to gain information about their views and experiences of a topic. I conceptualised the use of focus groups as part of the data collection strategy as I needed in-depth insight of my colleagues into their experiences in the accounting industry and accounting education. I envisaged a setting in which they would feel comfortable and not threatened relating their experiences. I thus arranged two small group discussions to create openness amongst a suitably sized cohort in which to discuss the integration of ICT into accounting education.
Focus groups are small groups designed specifically to focus on certain topics or issues enabling close scrutiny and lengthy discussion (Morgan, 2002), with the added advantage of possible stimulation from group interaction (Wisker, 2001). With several people in the focus group, ideas and issues tend to take shape and the subjects begin to form as participants debate certain issues (Neuman, 2000). Barbour (2007) supports the notion that participants might be reluctant to voice concerns, experiences or opinions in a one-to-one interview so focus groups serve to encourage active debate and group participation. The key to optimisation of focus groups has been referred to as the “collective sense, negotiated meanings and identities elaborated through the process of social interaction between people” (Wilkerson, 1999, cited in Barbour 2007, p.26). As a data collection method they can be used as a standalone data collection method or, as in the case of this study, combined with others (Barbour, 2007). The main purpose is to elicit experiences and understanding via the group’s interaction that would not be feasible using other methods, for example one-on-one interviews, observations or questionnaires (Gibbs, 1997). Focus groups are also sufficiently flexible to be included with quantitative methods as in a mixed methods approach (Barbour, 2007), nevertheless, a distinction is made between group interview, focus group interview and focus group discussions.

Focus group discussions are normally referred to as just ‘focus groups’ or ‘focus group discussions’, however, they are not the same as focus group interviews and group interviews. These are similar research methods and sometimes used interchangeably, which has resulted in some confusion, and as Barbour (2007) writes, a key characteristic of the two is that normally the same question or list of questions are asked to each participant in turn, whereas the emphasis on focus group discussions is the generation and analysis of interaction between participants. Morgan (1993) maintains that it is a myth that focus group findings need to be validated by quantitative methods, and in his later works (Morgan, 2002, p. 145) claims that this has become more accepted in applied sciences that previously relied heavily on quantitative methods.

Morgan’s (1993) response to claims that findings of focus groups need to be validated by quantitative methods is to present situations of evaluation research
in which specific contexts are the focal point. In these cases qualitative research has a clear advantage as a research methodology (Morgan, 1993). When the research topic involves “understanding the success or failure of a particular program in a specific setting, the focus group may well be the most efficient and effective tool for uncovering the reasons behind the outcome” (Morgan, 1993, p. 9). Focus group discussions were used in this study where the accent was on the groups’ interaction and the discussions that followed.

The motivation that prompted the use of focus groups in this study as an initial data collection point was firstly to confirm the need for ICT and accounting education to be integrated. Secondly, there was the need to prompt discussions and gain an understanding on relevant issues regarding current presentation of accounting software in the accounting programme. Finally, to elicit ideas and discussions on the design principles of the PSI as well as the integration model. The response to a call for participants from the staff of the Commercial Accounting department necessitated the formation of a further focus group. Each focus group made distinctive contributions to this study as well as serving as a validation of the overlapping issues raised and discussed in both of the focus groups. Despite focus groups becoming a major part of qualitative research, from market to health, the definitions have ‘organised discussions’ as a common factor (Flick, 2007; Gibbs, 1997).

Focus groups need to be managed in terms of group dynamics. In order to manage this it is important to set up the group carefully and to agree on ground rules about behaviour (Morgan, 1997). Silence and dominance are two types of behaviour that could inhibit general discussion. The researcher can act as facilitator to the group and use triggers, prompts or specific questions to develop discussion (Neuman, 2000). It is important to take due care in the topic guide and the selection of stimulus material that will encourage interaction as it is necessary for the researcher to steer the discussions for optimum interaction (Barbour, 2007). The role of the moderator is also a critical consideration.

At the outset the moderator gives a clear explanation about the purpose of the group and helps the participants feel at ease (Morgan, 1997). In addition, he or she “will need to possess interpersonal skills and be non-judgemental and
adaptable. These qualities will promote trust in the moderator” and increase the “likelihood of open and interactive dialogues” (Gibbs, 1997, p.5). I was able as researcher to act as moderator for both groups. The researcher also needs to decide whether to use open-ended, semi-structured or structured focus groups (Wisker, 2001), and in my case I opted for the open-ended structure as the group structures were focused by nature, being all accounting lecturers in the department. I felt that it would be unlikely that a fully structured interview would work with the focus groups because it would be too restrictive of the discussion. Wisker (2001) maintains, however, that the use of some form of structure and clear questions in a schedule is necessary to keep the group focused (Wisker, 2001), whilst for Gibbs (2007), in order to keep the group focused the interaction will need to be open-ended and not predetermined. However, focus groups need clearer and firmer ground rules than individual interviews, such as: taking some responses in turn so that one person does not dominate; prompting all participants to speak; and being polite and respectful and not letting others cut in (Wisker, 2001). Focus groups require more planning than other types of interviewing, including the selection of appropriate venues and ensuring there is a suitable method of recording the focus group interviews (Gibbs, 1997).

Gibbs (2007) regards the benefits of focus groups as being the gaining of several perspectives about the same topic, and insights into the group’s understanding of the topic and the ways in which the group is influenced by others in a group situation (Barbour, 2007; Gibbs, 1997; Kitzinger, 1994; Morgan, 1997). The distinguishing feature of focus groups is the insight gained by the interaction of the group, which also creates opportunities for the participants to question one another and to re-consider their own understanding of their specific experiences (Gibbs, 1997). The invitation to be a participant in the focus group was given to all the staff members of the department of Commercial Accounting at one of the staff meetings, in which I also highlighted the purpose and objectives of the study and linked it to the process to be followed by the focus groups.

The invitation was open to all first-, second- and third-year Accounting lecturers in the department, irrespective of the amount, if any, of their exposure to accounting software. The response warranted the formation of two focus groups, comprising
four participants in the one group and three in the other, the latter reduced by illness by one on the set date. No criterion was used to divide the staff into the two groups other than their availability according to the lecturing timetables. Barbour (2007, p.72) writes that “there is no magic formula regarding the number of focus groups to hold or to the number of participants in a group” (Barbour, 2007, p. 72), however I believe the size and mix of experience in lecturing, seniority and exposure to accounting software was optimal in generating interaction and discussion among the participants.

In observing the two groups’ interactions and participation I argue that the group size and structure fostered an effective medium for me to gain an understanding of and insight into their experiences and views on ICT integration into accounting education. A synergy was created as all the participants’ efforts and resources available are centred and concentrated in the accounting education of career-focused diploma students. The focus groups’ interaction allowed more insight into their experiences and provided more understanding of their views than if I had conducted individual interviews. In this process of understanding and collating experiences of the diploma lecturers, I aimed to verify the following:

- Verification of the lack of integration in accounting education and accounting software in the diploma programmes, hence the verification of the gap in the accounting education of the accounting diploma graduates
- Verification that the accounting software presented on the degree programme was not integrated in the accounting education of the degree students
- Views and key principles for the integration model for the diploma students
- Key features in the design of the PSI for the diploma lecturers
- Practical problems and tensions expected in the implementation of the integration model to the diploma students.

After the focus groups discussions, the next step was to investigate the presentation of accounting software to the degree students. There was only one lecturer involved and therefore the one-on-one interview was the most effective and efficient method of data collection under these circumstances. Although my
primary objective was to collect facts on the operational side of the presentation of accounting software to the degree students, I planned to gain insight into the lecturer’s views and a basic understanding of the effectiveness of the mode of presentation to the degree students. My initial investigation showed that the intention was to limit the exposure of accounting software to a basic knowledge about the operations of the software. I needed verification of this and the extent and depth of knowledge intended to be transferred to the students.

3.3 INTERVIEW AND DATA COLLECTION

A qualitative interview aims at uncovering people’s experiences, insights and views to enlighten and explain research topics at hand (Warren, 2002). The interview produces knowledge through the interaction between the interviewer and the interviewee. For effective interviewing the researcher should probe and elicit elaboration of detail, further explanation and clarification of responses (Fraenkel & Wallen, 1996). An interview can be compared to a form of conversation (Flick, 2007b), with examples of research interviews being narrative, factual, focus group and confrontational. It is usual for the interviewer also to be the researcher, as was the case in this study.

Kvale (2007) presented an exposition on the history of interview research, including in the social sciences, in his book ‘Doing Interviews’, a summary of which is presented here. The collection of systematic information via conversations is a traditional way of obtaining information for the recording of history and developing knowledge, dating back at least to Socrates who developed philosophical information through conversations with his Sophist opponents. Qualitative interviewing, meanwhile, has been extensively used in social sciences but the systematic literature on research interviewing is a relatively recent development. It is a key research method that has been used in its own right in the social sciences since the 1980s, with methods ranging from participant observation over interviews to in-depth analysis, such as discourse analysis. Conversations, discourses and narratives are viewed as essential contributors to obtaining knowledge of the social world (Kvale, 2007, pp. 5-7).
Gray (2009), Kvale (2007), Flick (2006), and Babbie and Mouton (2001) support the following definition containing essential features of an interview that qualifies as a qualitative research interview:

- The interview is a conversation that has structure and purpose.
- The interview can be structured, semi-structured or unstructured. The unstructured includes the non-directive and the informal conversational interview.
- The purpose is determined by one party, namely the interviewer.
- It is a professional interaction that goes beyond the spontaneous exchange of views.
- It follows a questioning and listening approach in the control of the interviewer.
- The interview is a site for the social construction of knowledge of the human situation under review.

In educational settings, lecturers, administrators and policymakers are generally considered as being “in the know” and “respondents of choice” (Tierney & Dilley, 2002, p. 459). The interviewee selected was a Pastel software lecturer on the degree programme and the interview followed the semi-structured approach that was in line with its main purpose, namely to obtain an overview of the logistics and all operational issues regarding the presentation of accounting software, Pastel, to the accounting degree students. The second objective was to obtain the lecturer’s view and understanding of the effectiveness of the course and determine whether the course objectives were being attained. This included an overview of the content of the course. The final objective was to get an insight into whether the course in its current form was sufficient for the degree graduates. The purposes were explained and agreed upon before the interview time and date was set. It was a professional interaction as I set the stage for the interview and controlled the sequence, with the view of factual data collection and gaining insights that would contribute to this study.

Kvale (2007) uses two metaphors of the interviewer, one as a miner and one as a traveller, the former being a knowledge collector and latter a knowledge producer. A miner will regard the interview as a site for data collection with the data analysis
seen as a separate phase. The data-mining concept is the idea that the knowledge is already ‘there’, just waiting to be discovered: “The interviewer digs nuggets of knowledge out of a subject’s pure experiences, unpolluted by any leading questions” (Kvale, 2007, p. 19). The traveller metaphor leads to interviewing and analysis as interwoven phases of knowledge construction: “The interview-traveller wanders through territories and enters into conversations with people he or she encounters along the way. The meanings in the original stories unfold through the interpretations of the traveller. The journey may or may not lead to new knowledge” (Kvale, 2007, p. 19). The traveller metaphor leans more to the understanding of knowledge as it is socially constructed (Kvale, 2007, p. 20), but I was able to identify with the miner interviewer in that I was able to dig out facts and insights from the lecturer’s experiences after lecturing ICT and accounting software to the accounting degree students for over 11 years.

Kvale (2007, pp. 37-50) has structured seven stages that form part of the “interview journey”, these being thematizing, designing, interviewing, transcribing, analysing, verifying and reporting. He maintains that the more pre-interview planning is given “to thematizing and analysing the higher the likelihood of producing high-quality interviews and the more likelihood of producing new knowledge” (Kvale, 2007, p. 50). Pre-interview planning is important and ‘thematizing’ refers to the formulation of the research question and a theoretical amplification of the theme to be investigated. The purpose of the interview should be clear, as should pre-knowledge of the subject matter to be investigated. In planning for the interview with the degree lecturer it was important to have planned what I needed to know about the presentation to the degree students of accounting software. As part of the interview pre-planning, I also planned the investigation into the extent of the integration of ICT and accounting education for the degree students. The design of the interview is also part of the pre-interview planning phase.

Designing an interview involves the procedures and techniques of the interview. As the interview was not a large systematic investigation of this study a semi-structured approach was followed (Kvale, 2007). The informal interview approach did not cloud the purpose and the objectives of the interview were attained.
Conducting the interview is the next phase and usually there is an interview guide of questions, also referred to as the ‘interview script’.

The type and quality of the questions are important for a successful interview (Gray, 2009), and the researcher should talk less than the respondents, using just a few words to prompt them. Statements about the purpose and the focus of the study as well as confidentiality assurances are made at the beginning of the interview. The order of questions varies and is generally grouped by topics, with complex, controversial or difficult questions normally reserved for the latter part of the interview (Fraenkel & Wallen, 1996, p. 430). Active listening skills involve attentive listening, which means listening for changes in tone and emphasis that would give rise to opportunities for new or significant themes (Gray, 2009).

It is important to capture the words of the interviewee accurately and a tape recorder not only does this but also gives an opportunity to focus on the process of listening and re-focusing of the interview. The recording then makes it possible to make a full transcription (Gray, 2009; Kvale, 2007). Analysis and validation of the interview is made below, whilst ethical issues were discussed in Chapter 1.

The focus groups and the interview was part of the data collection phase which is part of design phase one of the DBR plan for this study and contributed to the development of the four stages of the implementation plan. The findings of the focus groups and interview will be presented in Chapter 4. The iterative cycles of data collection within my own personal experience in lecturing and accounting practice also contributed to the four stages of the implementation plan. Design phase 3 signified the start of the planned series of interventions for the staff, which I grouped into three types of staff workshops. The first planned staff intervention was the staff buy-in workshop. The second set of interventions I have termed the ‘staff gateway workshops’, as these provided the avenues for further staff interventions as well the potential for the implementation of the integration model. The third category of intervention was the staff orientation workshop, in which the direction and course of action was presented for further staff interventions for the full implementation of the integration model. Each of these staff interventions further refined and validated, in iterative cycles, the four stages of the implementation plan. The interventions served as data collection avenues
and, hence, have been included in this section which highlights the methodology used for data collection.

3.4 STAFF BUY-IN WORKSHOP AND DATA COLLECTION

The staff buy-in workshop's main purpose was to inform the staff of the design development of the core elements of this study housed in design phase 2. The invitation was to the staff and management of the department of Commercial Accounting as they were the unit of analysis of this study. The invitation was also extended to the Dean of the faculty, the Association of Accounting Technicians (AAT), an affiliated professional body, a business associate from Acctpac accounting software, my study supervisor and members of the doctoral committee. The venue was on our campus and easily accessed. It was on a Friday during the normal departmental scheduled meeting time. There was close to 100% attendance of the permanent and part-time lecturing staff, including management. Of the extended invitees, six out of eight attended. The meeting was scheduled for two hours, including two opportunities to complete the feedback forms which have been analysed and the findings included in the next chapters. Figure 3.1 (below) represents the invitation distributed to staff, management and extended invitees.
The programme or the agenda for the workshop was designed for the staff firstly to help them understand and identify with the gap in the integration of ICT and accounting integration, as items 1 and 2. Staff were given the opportunity to identify personally with the gap in accounting education by completing the feedback forms, as item 3. It was necessary to outline the intended process to close the identified gap, and item 6 facilitated subject group discussions and the completion of feedback forms. This was an important workshop to facilitate the sharing of information and to obtain an overall view of the staff perceptions of their own needs for training on accounting software, as well as and the needs of the subject groups. Although the focus of this study is the integration of the subject now, as financial accounting with accounting
software, it is generally accepted that the other financially related subjects draw from the information processed by an accounting system. Subjects in the diploma qualification that have a strong and direct link to an accounting system are cost and financial management, auditing and taxation. It was decided to open the invitation to all the staff in the department of Commercial Accounting, not only the financial accounting lecturers, for the following reasons:

- The staff in the department had been exposed in their qualifications to financial accounting and over 90% had studied financial accounting as a major subject
- All the staff had the potential to lecture in financial accounting and were therefore in a position to contribute to this study, even though their area of specialisation in lecturing was in the related subjects of cost and financial management, auditing and taxation
- All the staff needed an opportunity to be part of the PSI.

It was necessary to clarify from the outset of the presentation the evolution of the job description of financial specialists to a greater reliance on technology. It was also imperative to highlight to the staff that accounting education has not evolved to the extent required by industry and thus has left a gap in the knowledge and skills of the accounting graduates. The staff attention was drawn to the critical need for ICT and accounting education disciplines to merge. Evidence from other studies was presented, for the evolution of the job description of financial specialists and for shortcomings in formal education at South African universities. This was necessary to substantiate my claims regarding the urgency for change in accounting education through the integration of accounting education and ICT.

The design and methodology of this study was explained in order for the staff to support the notion that the research was of a rigorous nature. The design which is based on DBR principles and within the framework of CHAT was emphasised to
authenticate and validate the procedures followed in this study. This was important to the study as the successful design of the interventions would not have been possible without their collaboration and shared learning experiences.

The CHAT features, as this study’s framework, were elaborated upon and explained. Particular reference was made to the range of variables under consideration in this practical study. The rules, the community, the division of labour and the tools in a complex system of activities and tensions were highlighted to reassure the staff of the balanced and complete view that was taken in this study. The activity system of Engeström (1999), as an analytical lens in the analysis of feedback forms, the focus groups and the interviews, were emphasised. The importance and value of the staff’s input in the design and development of the solution to the integration of ICT in accounting education was a key feature in the design of this study. The four iterative cycles that are instrumental in the refinement of the design of the solution were continually reinforced in this workshop. It was important to provide evidence to the staff that in the first of the iterative cycles seven staff members of the department had been part of the process as participants of the focus groups.

Feedback on focus groups and interview...problems identified...

Currently – diploma students no accounting software. Degree students exposure six months in 2nd year:
Treated as separate subject; not taken seriously; problems with accounting terminology; not using lab time; graduates - not enough exposure and “use it or lose it”.
No deep learning and no integration into accounting

Feedback on focus groups and interview...Suggestions...

Incorporate in all three years - “don't forget how to do it”
Link other subjects with accounting software
Staff training on software needed before adapting classroom – “lecturers must be hands on or students will be lost”
“Do not lose focus on theory and take that theory and apply it”
Cut irrelevant topics from syllabus
“Get as close to real life as possible”
All agreed change is urgent
SARS software for IT education in tax
The problems and suggestions identified in the focus groups and in the interview were highlighted, to reinforce the need to change the epistemology and pedagogy of accounting education. There was at this point more ‘real-life’ evidence to substantiate this study’s claims. The staff were now in a better position to agree and support the need to change and be part of the process of integration of ICT and accounting education. It was evident in the feedback forms that they identified with the need for change and that the integration process would benefit them in the upgrading their own personal skills in accounting software. The staff also identified with the need to be part of the process for the benefit of their students by closing the identified gap in accounting education and ICT in industry. I realised in my informal discussions with staff that these study ideas and proposals for change, to such a radical and large degree, were stressful. Attendance was voluntary and I realised that a certain degree of humour in the right places would perhaps increase the willingness of the staff to participate in the discussions and brainstorming sessions. There was firstly a discussion and question and answer session on the personal needs of the staff. The feedback forms asked them to identify with the need to change and to give reasons for or against the need to change their pedagogy. The proposal of the PSI was discussed and an opportunity given for them to identify the types of interventions they would prefer. The feedback forms were anonymous so as not to create any barriers in the identification of their needs in the responses. At this point the personal feedback forms were collected.

The next phase of this buy-in staff intervention was to outline the proposal of the integration model. One of the findings of the focus groups was that the accounting subject was presented as compartmentalised topics with a new set of rules that the students had to root learn for each topic. The accounting system was not presented as a whole system which left the learning fragmented and superficial. This contribution from the focus groups refined the development and
design and was presented as a key feature in the iterative cycle of the development of the integration model. The staff were in a position to identify with the whole process of the iterative cycles from the focus groups and interview. The ‘use or lose’ concept proposed in the focus group and interview was also demonstrated for incorporation in the integration model. The purpose of highlighting this development was to emphasise and demonstrate that their contributions to the design and development of the solution were valued and important. The need to demonstrate the importance of the shared learning experience with the incorporation of the suggestions in the solution was an integral part of the buy-in process and for the reinforcement of the participation element for this first staff intervention in the planned series of interventions.

The four key conceptualised parts of the integration model were presented to the staff at this intervention incorporating the findings of the focus groups and interview. The identification of the four rules of the accounting system was presented first. The conceptualised part of the integration model that I have termed the ‘heart of accounting’ is an integral part of the rules of accounting and was explained within the presentation of the four rules. The third feature, being the map of the accounting system, was presented after the four rules. This was to enable the staff to link these rules with a global view of the accounting system as a whole, or the map of accounting system. Lastly, the four rules were colour coded to match the accounting system and the integration model was then presented as a unified whole in which each rule was linked to the accounting system. The key features of the structure and the design and development of the integration model are

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**Identification of 4 rules of the accounting system**

1. Identify assets, liabilities and owners equity
2. Classify and manipulate A, L, OE
3. Double entry system
4. Accounting equation
included in the next chapter. The next phase in this buy-in intervention was a presentation made by a representative of the accounting software industry.

I considered the representative to be an expert as he has been involved in the installation of accounting software for over 25 years and has been in the fortunate position of witnessing rapid changes in technology in the finance world of industry. The main focus of this part of the presentation was to demonstrate to the staff the need for graduates to have the knowledge and skills to cope in the real world as accounting graduates. Included in the presentation were examples of the flow of information in a fully integrated accounting system as well as real-life examples of the necessity for the combination of knowledge and skills required by accounting graduates in industry. The above two slides are from the Sage Accpac website (Sage 300).

The feature and objective of the integration of accounting software into accounting education is to iterate and reinforce the relevant content on the system for all three years of the diploma, thereby developing the skill and knowledge hand in hand for the graduates to be able to remain relevant within a dynamic environment. The importance of holistic training for a graduate to cope with all aspects of business decisions was emphasised and the businessman doing the presentation reinforced the notion that all the accounting-related subjects should have some element of integration with accounting software. This part of the presentation led to the final phase, in which the staff were asked to consider how their subject, whether accounting, cost and finance management, auditing or taxation, could integrate with accounting software. Staff were divided into their subject groups and asked to select a scribe for the group. The questions asked were as follows:
Do you see your subject integrating with accounting software?

Why? / Why not?

How do you see your subject integrating with accounting software?

How could you get the students to engage with accounting software?

Do you have any other comments, ideas or suggestions?

Although the focus of the study is the integration of accounting software in the subject financial accounting, the management and staff have identified with the need for the more holistic training of a graduate and thus supported this phase of the intervention.

The feedback forms were collected for analysis.

The idea of the integration of technology and accounting education led to the formation of the acronym ‘TEA’ - Technological Education in Accounting and the workshop ended with an invitation to: Let’s have TEA together for the benefit of the graduate and for an actual cup of tea.

The focus groups and interview constituted the first of the four iterative cycles of the design of this study. I termed this cycle ‘the substantiation cycle’ as my proposals and ideas to close the gap in accounting education needed to be confirmed and substantiated by my colleagues. The next three cycles were termed ‘the authentication and refinement cycles’ to validate the proposed four stages of the implementation plan. The staff
buy-in workshop, cycle 2, as the first staff intervention was followed by the gateway workshops, cycle 3, and then by a staff orientation workshop which was cycle 4. There were three workshops with staff and management, which I termed ‘gateway workshops’, and which were instrumental in creating potential avenues for the implementation of the integration to be effected.

3.5 STAFF GATEWAY WORKSHOPS AND DATA COLLECTION

The staff buy-in workshop influenced the re-structuring and the re-curriculuation of the National Diploma in Accounting. The integration programme was accepted by management as a feasible solution for the integration of accounting education and accounting software. Accounting software has been integrated in all the subjects presented by the department of Commercial Accounting and the changes were implemented by management. The new diploma is a unique UJ diploma called the diploma in Accountancy, each subject of which presented by the department of Commercial Accounting has a new overriding feature that is presented in the documentation for the diploma as follows:

‘...and to convert this embedded knowledge practically into an accounting software program’.

This is from a new provision in the purpose statement for the diploma:

‘PURPOSE

The purpose of this diploma is to provide accountancy knowledge and skills to ensure competence in performing reporting functions, and rendering taxation services and management advisory services on an accounting technician level, and to convert this embedded knowledge practically into an accounting software program. (University of Johannesburg, 2011)

The first gateway workshop was hosted by management for the purpose of identifying areas in financial accounting, cost and finance management, auditing and taxation, to align the diploma to a professional body for possible accreditation as well as the incorporation of the integration with an accounting software
program. The accounting software program identified for the diploma students was *Pastel*. The findings of the buy-in workshop, focus groups and interview were accepted by management as a practical implementation solution. The complete syllabi for the three years in the financial accounting subjects were aligned to the integration model of this study in a further gateway workshop with the accounting lecturers. Although the workshop was hosted by management the recommendations from the development and design of the integration model from this study were implemented in the re-structuring of the financial accounting syllabi. This change served to secure the implementation of the integration model in 2011.

The second gateway workshop took place between the *Pastel* representatives and the management of the Commercial Accounting Department, the researcher and the Dean of the Faculty of Economic and Financial Sciences, under which this diploma is housed. The purpose of this workshop was to obtain the buy-in of *Pastel* to train the staff of the department according to the design principles of the PSI that was developed in the design and development phase 2 of the iterative cycles of this study. *Pastel* agreed to train the staff according to departmental requirements, and subsequent meetings with the company were scheduled for the design of the training and the planning of the training schedule.

The third gateway workshop was between the *Pastel* representatives, the management of the Commercial Accounting Department and the researcher. The purpose of the third gateway workshop was to plan the staff orientation workshop and the design of the training. This meeting was recorded and all the feedback has been analysed and incorporated in the design of the subsequent staff interventions. The agenda for this workshop was as follows:

**Agenda for Meeting between Management and Pastel on 5 May 2010**

1. **Purpose of orientation PSI**

Features of *Pastel Evolution*
Integration model and PSI

Needs of staff

Identification of integration leaders to report to subject heads

2. Features of integration model

Accounting and other subjects and curriculum

1st year’s priority in 2011 and 2nd and 3rd years short courses in Pastel

3. Features of Pastel

Presentation Pastel with integration model

4. Features of PSI – main focus for feedback

Teaching and learning and Pastel

Group per subject level

Flexible

Commit and engage

Structure of plan and check points

5. Structure of meeting on Monday 10 May

Information: Integration model and Pastel and PSI

Feedback forms complete during presentation for need identification

Plan for leader identification on forms

Pastel core for everybody or the Recognition of Prior learning (RPL) programme with refresher course

6. Practical implementation considerations

Laptops and Pastel for each staff member

Training of tutors
Training to include PSI for development of course material for 2011

7. Feedback forms and information packs for Monday 10 May

Pastel brochures for all

Curriculum of Diploma in Accountancy to all

3.6 STAFF ORIENTATION WORKSHOP AND DATA COLLECTION

The staff orientation workshop was the fourth intervention in the cycle of refinements to the design development of this study. It was held on the 10 May 2010 and all the staff of the Commercial Accounting department were invited. It was a combined team building, departmental staff meeting as well as the staff orientation workshop. The agenda was as follows:

Presentation of expected integration process of *Pastel* and accounting education - 10 May 2010

Agenda

1. Introduction and information packs
2. Integration model and further planned series of interventions
3. *Pastel Evolution*: core and add on modules
4. Design and features of further planned series of interventions
5. Practical implementation considerations

1. The information packs included the *Pastel Evolution* brochures, the structure and layout of the integration model, the new accountancy diploma information pack and the feedback forms.

2. The features of the integration model and the continuation of the staff interventions were highlighted. The staff were asked to comment on the integration model.
3. Pastel representatives highlighted features of Pastel Evolution and the add-on modules of Pastel evolution. The staff were asked to complete section B of the feedback forms to identify what training on Pastel they needed.

4. The design features of the further series of interventions were presented to the staff for discussion.

5. Practical implementation considerations and issues were raised and discussed.

6. The need for project leaders was raised in the last of the gateway workshops. The staff were asked to nominate themselves for consideration to be a project leader.

The feedback forms were collected and analysed. In the next section the processes and procedures of data analysis are discussed.

3.7 DATA ANALYSIS

This study has four cycles from which data was generated, then analysed based on some of the principles and procedures of grounded theory content analysis. Grounded theory has been noted to be a comparative method (Charmaz, 2008; Pidgeon & Henwood, 2009) which has complemented this study. In Pidgeon and Henwood, (2009) discussion on the strategies for conducting grounded theory research, attention is drawn to the importance of the iterative cycles in the flow of work, necessary to promote constant comparison of the data. Through the “continuous interplay between the data analysis and the data collection process” the approach has also been termed the constant comparative method (Strauss & Corbin, 1998, p. 158). The strategy of cycles of grounded theory complements the DBR iterative cycles of this study and supports the analysis of the data of this study. Grounded theory facilitated comparison from the data collected from each of the four iterative cycles as well as between the focus groups and interview. The focus groups were held with the lecturers in the diploma programme and the interview was held with a lecturer in the degree programme. The data collected facilitated comparisons between the diploma lecturers in the analysis of the focus
groups as well a comparison between the diploma and the degree lecturers when the data was compared between the focus group and the interview.

A development of the grounded theory approach is termed by Charmaz, (2008, p.206) as the constructivist grounded theory approach for data analysis and interpretation, which does “not assume that data awaits discovery”, but rather the researcher analyses and interprets the data with an interpretive frame of reference focused and centred on the research question (Gibbs, 2007). The data is analysed and interpreted around the aims and objectives of the study and the conceptual categories arise “through our interpretation of data rather than emanating from them” (Charmaz, 2008, p. 206). I cannot claim that I “converted the raw data into patterns of meaning by simply letting the data speak for themselves” (Henning et al., 2004, p. 105) however, I believe that the notion of a constructivist grounded theory approach (Charmaz, 2008; Denzin & Lincoln, 2003) is a better fit for this study’s content analysis. Charmaz (2008) contends that grounded theory guidelines should be adapted as a tool of analysis and that in the interpretation of the data a broader view be taken. Pidgeon and Henwood (2009) maintain that a constructivist-interpretive approach requires a broader frame of reference when analysing and interpreting data. In this broader view, recognition should be given to the notion that data is constructed by the researcher and the participants through their shared experiences (Greyling, 2007). Greyling, (2007) maintains that the assumption of constructivist grounded theory was appropriate for her study and it was also relevant for this study as I had certain expectations during the analysis and interpretation of the data on the construction of the draft design principles of the integration model and the PSI.

Coding involves data being “separated sorted and synthesized” (Charmaz, 2006, p. 3) and facilitates the making of comparisons with other data, thereby building knowledge. This is done during the analysis and interpretation stage, with line-by-line coding serving as “analytic scaffolding” (Charmaz, 2008, p. 217) in a constructivist grounded theory approach. In this study coding was of the focus groups and interview transcripts, facilitating in-depth analysis (Pidgeon & Henwood, 2009). Line-by-line coding aids in analytical thinking as it keeps the researcher “close to the data” (Gibbs, 2007, p. 52) and therefore adds validity to
its interpretation. Using CHAT as a frame of reference for the analysis and interpretation of the data enabled me to recognise the pertinence of the history and experience of the participants in my role as researcher.

In conjunction with line-by-line coding, I highlighted the action or doing verb in each data statement. The use of action codes, as introduced by Charmaz, (2003) and supported by Lautenbach, (2005) and Greyling, (2007), was the process followed. The initial coding is defined by the action in the data statement and reflects grounded theory practice (Charmaz, 2008). Charmaz, (2008, p. 216) defines action codes as:

... active, immediate, and short. They focus on defining action, explicating implicit assumptions, and seeing processes. By engaging in line-by-line coding, the researcher makes a close study of the data and lays the foundation for synthesizing it.

The use of action codes together with line-by-line coding not only facilitated an in-depth analysis of the data but also assisted in gaining insight into the data as well as highlighting the “interrelated processes rather than static and isolated topics” (Greyling, 2007, p. 80). An added benefit of the use of codes that imply action was the ease of categorisation in linking them to Engeström’s (1999) activity system.

In the first review of the line-by-line analysis of the data the action codes were identified and categorised into the six interrelated processes identified in the activity system as conceptualised by Engeström (1999). This activity system was used as a thinking tool in the analysis and interpretation of the data. This recognises all the interlocking forces and relationships that are relevant and pertinent to ensure a complete and comprehensive analysis and interpretation of the data. It helped me organise the data and helped me to approach the data analysis in a systematic and methodical manner. The selective codes link the data to the objectives of the study and the four stages of the implementation plan (Gibbs, 2007; Gray, 2009). In the second review of the data the selective or core codes used were the four draft design categories of this study, namely the draft
design principles for the gap verification and validation; the integration model; the PSI; and the draft design principles for practical implementation.

3.8 PROCESSES AND PROCEDURES IN THE ANALYSIS

In this section I explain the processes and procedures followed in the analysis of the data of each of the four cycles. The design of the study is also briefly outlined for purposes of clarification of the process. The analysis of the data includes the process from categorisation to interpretation of the findings of each cycle. Each of the cycles includes a process of data collection, analysis and interpretation.

3.8.1 Outline of design phases and cycles

The design of this study consists of four phases. Phase one, two and three are linked by four cycles. An outline of the design was shown in Chapter 2, Figure 2.5, and is reproduced here for ease of reference, in which the cycles are shown as arrows labelled 1, 2, 3 and 4. The PICs enhanced the four stages of the implementation plan and are linked to design phase 2.

![Diagram of design phases and cycles]

*Figure 3.2:* Outline of design phases and cycles
There were four distinct design phases in the structure of the study which are linked by iterative cycles to refine and authenticate the four stages of the implementation plan. Design 1 was the data collection phase from the focus groups and interview and consisted of cycle 1 – depicted as an arrow in Figure 3.2 (above). I termed the first cycle the ‘substantiation cycle’ as my ideas and proposals from the PICs needed to be confirmed by my colleagues. Design phase 2 is termed the ‘design development phase’ and is linked to phase 3 from which the remaining three cycles feed for the purpose of the authentication and refinement of the draft design principles. Design phase 3, the staff workshop and PSI initiation, was conducted in three cycles to ensure staff buy-in and support and sustainability of the process of implementation from management. These three cycles served to enhance, refine and authenticate the draft design principles developed in design phase 2 and are represented as arrows 2-4 in Figure 3.2 (above). Design phase 4 was the implementation stage, and the final one in the design of this study. Each of the four cycles served to strengthen and reinforce the draft design principles and to produce what was practical and feasible for implementation.

3.8.2 Personal iterative cycles of data collection

In Figure 3.3 (below) a more detailed depiction of the PICs is illustrated. The PICs included reviews of literature in accounting and education. The PICs and the literature reviews together provided an avenue of research through which I was able to identify the four stages of the implementation plan. The PICs link to design phase 2, which was the phase for the design and development of the four stages of the implementation plan. The four cycles served to continually refine and verify the core design elements and thus by this process of supporting and upholding, the principles were further developed and enhanced.
The iterative cycles of data collection from personal experience and relevant literature laid the foundation for the draft design principles, namely the gap verification and validation, the integration model, the PSI and the practical implementation. These four stages of the implementation plan needed to be supported and substantiated by staff, management and in the industry of accounting practice. The next section will look at the process followed in the analysis and interpretation of the data collected from the focus groups and interview.

### 3.8.3 Substantiation cycle of data collection

The data collected from design phase 1 was from two focus groups and one interview. Design phase one is depicted here to highlight the procedure followed in the substantiation cycle of data collection, and provided the impetus that supported and validated the four distinct parts of the implementation plan. The four parts are presented within design phase 2 in Figure 3.4 (below).
The process followed in the analysis and interpretation of the data collected from the focus groups and interview is illustrated in Figure 3.5 (below). The action taken on the left hand side is linked to the analysis process on the right hand side. An explanation is provided in the notes following the illustration of the analysis process and paragraphs are numbered in the same sequence as the actions taken.
1. Conducted the focus groups and interview

The invitation to be a participant of the focus group went to all the staff members of the department of Commercial Accounting, who were sufficiently keen to warrant the formation of two focus groups. One focus group had four participants and the other focus group only three. The first focus group consisted of four of my colleagues and the cumulative total lecturing experience of this group was approximately 35 years at the time. The second focus group had only a total of
approximately 9 years lecturing experience, however, this group of three colleagues were all graduates of the degree programme that I investigated in the interview. I was able to verify and validate much of the information I had gained from the second focus group during the interview, particularly relating to the depth of the knowledge and understanding gained during their studies on the degree programme.

2. Produced the transcripts

The focus groups and interview were tape-recorded and a full transcription made, including all the pauses and breaks in the discussions. The purpose of the transcripts was not for a discourse analysis so the transcripts were retyped to promote the flow of the conversation and discussion without adjusting or tampering with the actual words used or their meaning.

3. Line-by-line coding into six dichotomies

By using CHAT as an analytical framework I was able to ensure that no detail was overlooked and the relevance of the history and experience of the participants was recognised to ensure a comprehensive analysis. With line-by-line coding the action or doing verb was identified and categorised into the six interrelated dichotomies of Engeström’s (1999) activity triangle. The activity triangle provided an objective and comprehensive avenue to ensure that all aspects of the discussions were categorised into the six dichotomies. All the interlocking forces and relationships that were relevant and pertinent to this study were acknowledged. Discussions pertaining to the lecturers were categorised under ‘subject’. The ‘community’ included accounting practitioners, accounting industry in general, graduates and students. Any discussions on faculty, academic, curriculum and assessment rules and regulations were categorised under the process ‘rules’. The process ‘division of labour’ related to issues of management, such as the provision of the infrastructure for the implementation plan. ‘Mediating artefacts’ category was used for issues relating to the ICT tool, books, accounting software and other educational tools. The ‘object’ category was used for topics and issues relating to the process of integration. Both of the focus groups and the interview transcripts were categorised into these six
categories using action statements by identifying verbs such as suggesting, claiming, stressing, affirming, agreeing, highlighting, admitting recognising, realising, identifying, implying, challenging and expressing. The actions verbs were then linked to the six dichotomies in Engeström’s (1999) activity triangle.

4. Analysis and organisation of data into the four stages of the implementation plan

In the second review of the data the selective codes used were the four stages of the implementation plan. The second review of the data was conducted from the first categorisation in which each of the six dichotomies was further interpreted into the four stages of the implementation plan. The two reviews of the data provided a systematic and methodical approach for the interpretation of the data.

3.8.4 The three authentication and refinement cycles

The primary purpose of the staff workshops was to obtain the staff buy-in to the four stages of the implementation plan. The second objective of this workshop was to assure the staff of the rigour and discipline of this study as well as to outline the intended process to close the identified gap in accounting education. The intended process to close the gap included the integration model and a presentation of an accounting software system which was presented by an installation accounting software expert from industry. These were an important part of the buy-in progression. The third objective was to create an opportunity for the staff to indicate the help they needed to change their pedagogy, then to indicate the type of interventions they would like.

This cycle 2 was the first of three staff workshops and the data collected was for the purpose of authenticating and refining the four stages of the implementation plan in phase 2 of the study. Cycle 2 is depicted in Figure 3.6 (below).
There were three entryway or gateway workshops, which facilitated the implementation of the integration model and the staff PSI. Management buy-in to the process to close the identified gap in accounting education led to the re-structuring and re-curriculation of the development of a unique UJ diploma, the Diploma in Accountancy. This process I have termed as the ‘first gateway workshop’. The purpose of the second workshop was primarily to obtain buy-in of Pastel to train the staff of the department in 2010 and to obtain their support on the process to close the identified gap. The first two workshops were hosted by the management of the department. Although, the re-structuring and re-curriculation of the diploma falls outside the ambit of this study these workshops were key gateways to secure the authentication and implementation of the integration model in 2011. The iterative cycles of this study facilitated the events which led to the buy-in of the staff and management and consequently led to buy-in of the staff and management, and consequently the clarification of the need to change the curriculum. The third gateway workshop was between the Pastel representatives, the management of the department and the researcher. The
The purpose was to plan the staff orientation workshop and the implementation of PSI. This meeting was recorded, transcribed, analysed and used for further authentication and refinement of the four stages of the implementation plan of this study. Cycle 3 is depicted in Figure 3.7 (below).

**Figure 3.7:** Design phase 3: cycle 3: staff gateway workshops: authentication and refinement

Cycle 4, as depicted in Figure 3.8 (below) was the final workshop in the series of the authentication and refinement process, its purpose being threefold. The first was to present the integration model and to highlight the features of the process to close the gap through the PSI. *Pastel* representatives highlighted the features of their evolution and the add-on modules, whilst staff were asked to indicate what training they required. Finally, practical implementation considerations and issues were raised and discussed and the feedback forms analysed.
The process followed in the analysis and interpretation of the data collected from the staff buy-in workshop, gateway workshop and the staff orientation workshop was similar to the process followed in the analysis and interpretation of the focus groups and interview. The explanation of the actions taken follow the same numbering sequence as shown in the Figure 3.9 (below).
Figure 3.9: Data collection and analysis: authentication and refinement cycles

1. Conducted the staff workshops

Three staff workshops were held with the staff of the department of Commercial Accounting: the staff buy-in workshop, gateway workshop and the staff orientation workshop.

2. From feedback forms and recordings produced the transcripts.
The delegates of the staff buy-in workshop consisted mainly of the staff of the Commercial Accounting Department in which I hoped to implement the integration model and the PSI. In attendance were representatives from industry, ICT and the management of the faculty. The staff completed personal feedback forms which contained five open-ended questions and one closed ended question. The questions were:

1. Is it necessary to change the way you teach? – closed ended question. Why? / Why not? - open ended question
2. What kind of help do you need?
3. Other needs to assist in your teaching?
4. What type of interventions would you like?
5. Do you have any other ideas or suggestions?

The staff were later divided into subject groups and one form per subject group was completed. The subject groups were credit management, cost accounting 1, cost accounting 2, financial accounting 1, internal control and code of ethics, taxation and one unidentified subject. All these subjects, except for credit management, are finance-related and included in the diploma programme for accounting. The five questions on the subject group discussions feedback forms were

1. Do you see your subject integrating with accounting software?
2. Why/why not?
3. How do you see your subject integrating with accounting software?
4. How could you get your students to engage with accounting software?
5. Do you have any other comments or suggestions?

The feedback forms from the staff buy-in were merged and analysed by question.

The third staff gateway workshop held with the management of the department, Pastel representatives and the researcher was recorded, transcribed and
analysed. The meeting later continued with the Pastel representatives and myself for the purpose of receiving feedback from Pastel on the integration model and the process to close the gap in accounting education. The second part of the workshop was also recorded, transcribed and analysed. Both recordings were analysed for authentication and refinement of the draft design principles.

The staff orientation workshop was held with the staff of the department of Commercial Accounting. This workshop was also recorded, transcribed and analysed for authentication and refinement of the draft design principles. The members of staff were asked to complete the feedback forms, which provided for comments on the integration model and for the staff to select their training requirements for Pastel Evolution core and/or the add-on modules. The feedback forms provided a summary of the design and features of the PSI and practical implementation considerations and were analysed to plan the implementation of the PSI.

3. Line-by-line coding into six dichotomies

The action verbs were firstly identified in the line-by-line coding of the open-ended questions on the feedback forms. Simultaneously, these were analysed and categorised into the six interrelated dichotomies of Engeström's (1999) activity triangle. This process acted as a safety net to ensure a comprehensive and complete imprint of the relevant and pertinent aspects of this study.

4. Analysis and organisation of data into the four stages of the implementation plan

In the second review of the feedback forms the data was further interpreted and categorised into the four stages of the implementation plan. The discussions recorded at the third staff gateway workshop and staff orientation workshop were categorised at the outset into the four stages of the implementation plan. The recordings were used to authenticate and refine the draft design principles.
3.8.5 Validation by implementation

Design phase 4, as shown in Figure 3.10 (below), was the final stage of the study and was the validation of the design principles through implementation and reflection. Each of the phases is dependent on each other and equally important.

![Figure 3.10: Design phase 4: Validation by implementation](image)

I argue that the role and contribution of each of the four phases supported and upheld the four stages of the implementation plan, and produced a programme that was practical and feasible for implementation.

3.9 CHAPTER SUMMARY

In this chapter the research methodologies have been discussed, with those of data collection in the substantiation cycle by means of focus groups and
interviews described. The authentication and refinement cycles, which included the three staff workshops, were presented, and the design of the study briefly encapsulated for purposes of clarification of the processes for analysis of the data.

In the next chapter the findings from each of the four cycles are presented, as categorised into the four stages of the implementation plan. The findings were categorised firstly into the four cycles and secondly for each cycle the findings were classified into the four stages of the implementation plan which then promoted the interpretation of the findings of the design principles for each of the four stages. The design principles are presented in Chapter 5.
CHAPTER 4:
FINDINGS FROM EACH CYCLE

4.1 INTRODUCTION

In this chapter I present the findings from each of the four cycles, the analysis, processes and procedures of the data which was explained in Chapter 3. The main purpose of each of the four cycles was to develop and refine the design of the integration model, the planned series of interventions (PSI) and the process to close the identified gap in accounting education and develop design principles, which are presented in Chapter 5, for each of the four stages.

The first cycle was the data collected from substantiation cycle and consisted of two focus groups and an interview. The members of the staff of the department of Commercial Accounting were invited to participate in two focus group discussions. The first focus group had four delegates with pseudonyms of Adel, Alvin, Amy and Andria. The second focus group had three delegates and has pseudonyms of Bonita, Bella and Betty. The interview was conducted with a lecturer in the degree programme with a pseudonym of Cherie.

The authentication and refinement cycles consisted of three staff workshops: the staff buy-in workshop; the gateway workshop and lastly, the staff orientation workshop. The findings have firstly been categorised into the four cycles and secondly, for each cycle, classified into the four stages as follows:

Cycle 1: Focus groups and interview findings (substantiation cycle)

1. Focus group 1: Gap verification findings from Adel, Alvin, Amy and Andria
2. Focus group 2: Gap verification findings from Bonita, Bella and Betty
3. Interview: gap verification findings from Cherie
4. Focus group 1: Integration model findings from Adel, Alvin, Amy and Andria
5. Focus group 2: Integration model findings from Bonita, Bella and Betty
6. Focus group 1: PSI findings from Adel, Alvin, Amy and Andria
7. Focus group 2: PSI findings from Bonita, Bella and Betty
8. Interview: PSI findings from Cherie
9. Focus group 1: Implementation findings from Adel, Alvin, Amy and Andria
10. Focus group 2: Implementation findings from Bonita, Bella and Betty
11. Interview: Implementation findings from Cherie

The findings from the focus groups and interview, being the first cycle and termed ‘substantiation cycle’, are presented in section 4.2 below. The findings from each of the three authentication and refinement cycles are presented as follows:

Cycle 2: Findings from the staff buy-in workshop
Cycle 3: Findings from the third staff gateway workshop
Cycle 4: Findings from staff orientation workshop

The data from the staff buy-in workshop was analysed from two sets of feedback forms. Firstly, the staff members were asked to complete a personal feedback form then asked to form subject groups, with the discussions from each recorded on subject group discussion feedback forms. The transcript of the recorded gateway workshop was used for the findings of cycle 3. The fourth and final authentication and refinement cycle, the staff orientation workshop, included findings from the feedback forms and the transcript of the workshop recording.

The next section details the findings presented under the headings of the four cycles.

4.2 FOCUS GROUPS AND INTERVIEW FINDINGS

The staff members were keen to participate and in order to accommodate their different lecturing timetables two focus groups were formed based solely on their availability. In the first focus group Adel, Alvin and Andria happened to have had some brief exposure to lecturing Pastel and as a separate subject to accounting students before the focus group. Bonita, Bella and Betty were all recent graduates from the same degree programme that I conducted the interview with the lecturer, pseudonym Cherie. The two focus groups enriched the findings with different experiences as the discussions had focal points centred on their diverse
understanding and encounters. In the interview with Cherie, I was able to support the findings of Bonita, Bella and Betty. The following findings were made from the focus group and interview.

4.2.1 Focus group 1: Gap verification findings from Adel, Alvin, Amy and Andria

The group was unanimous in recognising that the accounting graduates were not sufficiently skilled in ICT to meet the demands of the workplace. Adel claimed that accounting practitioners had little or no knowledge of accounting theory and, although they had the accounting software skill, this at times resulted in the incorrect reflection of accounting data and cast doubt on the representation of accounting records. However, Adel maintained that students did not have the ICT skills to convert their knowledge into practice. He added that the skills and knowledge that accounting education incorporates into its diploma programme should match what is used in accounting practice. Andria added: “then we can better equip them for the job that they are going to do.”

The group affirmed an urgent need for accounting education to adapt a process of integration of accounting software into accounting education, which Alvin affirmed by saying: “We [accounting education] are already behind.” He stressed that we should use accounting software of a high enough level that if our graduates should join a company using Accpac they could easily convert their skills. He then claimed that this would add value for our graduates: “and then we get ahead of the BCom degree students, then we will know more than them. I'm saying we should cover this niche. The industry is going to demand more students from us than them [degree students].”

4.2.2 Focus group 2: Gap verification findings from Bonita, Bella and Betty

Bella started the discussion with a story of her experience with accounting software. Bella was a recent BCom. honours graduate who had just married and her husband had started a business. She had been asked to help set up the accounting system on QuickBooks, an accounting software package specifically
tailed for small businesses. She agreed to help her husband after hours while she was lecturing at UJ, believing “...it can’t be that difficult.” She then described what happened when it was time to start working on the software: “They gave me the whole CD and stuff. He said that I needed to start... because I am the one with the degree. He had studied IT and I asked for his help and he asked me how come I didn’t know this-sales and everything. I said to him that I studied BCom Accounting and he asked me what I was doing now and I said that I was lecturing accounting. He said how can you lecture accounting when you can’t do normal sales on a program? So I laughed and I was embarrassed because I’m lecturing accounting... it was shocking actually.” Bella claimed that the skilled ICT support staff looked down on her as an accounting graduate without skills and that they were able to teach themselves the accounting software. She also admitted that they were more skilled on ICT and she felt belittled. Bella initially thought she could cope in accounting practice and took on extra work besides her full-time lecturing work. She admitted to having no exposure to the accounting software QuickBooks and recognised the inadequacy of her qualification for IT. She was embarrassed on being questioned about her ability and knowledge when she was in fact an accounting lecturer. Bella acknowledged a definite gap in her knowledge and skills: “... it’s like I don’t know real life.” Bella acknowledged that there was extensive use of ICT in industry: “no company will have a person sit at a desk without having a computer.”

Bonita and Betty confirmed then that they had the same qualifications as Bella, having completed six months of an IT module called Business Information Systems (BIS), which included Excel and Word as well as Pastel. The Pastel was not integrated in any way to the financial accounting subjects and it was task- and deadline-orientated. Betty made the following comments: “you have these specific tasks with deadlines – what I found is that you want to just get to the end-just get it done”. She also confirmed that: “we can’t even remember what we did. We might have done the stuff [Pastel] but I can’t remember”.

Bonita also had a story to tell: “I thought I had all this knowledge - I mean - I was going to do this audit - no problem.” Bonita informed the client: “you
need a proper accounting package. They just trusted me. I mean – so I got *Pastel* because I thought I knew *Pastel* ... it’s not like you can ask somebody should I pass this transaction in this way? You must actually know what you are doing.” Bonita’s story about her experience in accounting practice reaffirms that of Bella, acknowledging the limitations of her skills even though she was a graduate. She believed she was capable of assisting in practice and exposed the expectations of industry on her knowledge and skills as a graduate to be more than she could meet. She acknowledged that there was an identifiable difference in what was taught in higher education compared to what industry expected of a graduate. She recognised the need for understanding how accounting software operates and the current gap in accounting pedagogy: “definitely a big lack from real life and what we do here”.

Although Betty had acknowledged the necessity of integrating accounting software in accounting education she expressed a fear of losing knowledge in favour of skill: “if we are not going to focus on the theory and just think okay the program is doing it for me anyway so I don’t have to worry.” Later in the discussion she admitted that with the integration we do not lose any theory as the students need to understand how the accounting software operates to be able to apply the theory.

During the discussion certain claims and admissions were iterated. There were numerous affirmations that the integration of ICT into accounting education be urgently implemented and the group acknowledged that there was no integration or link of accounting software to accounting education in the classroom.

### 4.2.3 Interview: Gap verification findings from Cherie

At the time of the interview Cherie had been lecturing in Business Information Systems (BIS) for 13 years. The accounting degree students do BIS for a full year in their second year of a three-year degree. The first six months of the course covers *Microsoft Office* and *Windows* operating system, and the second six months includes the accounting software course *Pastel* as well as the theory on business information systems. The first semester has accounting-orientated questions but Cherie admitted that the second semester was not: “but I try to
make the second semester not so accounting-orientated.” Cherie believed that six months on Pastel was enough time to cover the work but not enough time for the students to get to know Pastel in its entirety. She affirmed that there was no integration with accounting and that the training was “very basic operational”, or, as she explained further, the teaching of Pastel was based on teaching the functions of the system. Cherie also confirmed that there were no add-on modules, such as Payroll, that was covered with the students.

Cherie believes that the graduates forgot the ICT skills of two years previously and that the accounting graduates had complained to her that they had forgotten ICT by the time they find employment. She had suggested that ICT be incorporated in all three years of the degree programme: “so they don’t forget how to do it.” However, there was no communication or interaction between her and the accounting lecturers, and Cherie claimed that they had informed her that the students did not have time in their third year to learn how to use Microsoft Office or Pastel.

The students had completed a year and a half of accounting before the Pastel component of the BIS subject in their second year, however Cherie claimed that they had a problem with accounting terminology: “and in Pastel sometimes they have a problem with accounting terminology which they shouldn’t have because they are accounting students in the second semester in their second year so they should know these things.” Cherie felt that these same students were ‘digital natives’, and that they learned quicker ways of operating the ICT systems which they then taught to the lecturers.

Cherie believed that the gap in skills and the current exposure to Pastel was not enough to close the gap in the skills required in the workplace. She affirmed that the graduate feedback received was that ICT was not enough to prepare them for the workplace: “I’ve said this before, what I would like to see is for them to be learning to do computers in the first, second year, excuse me, third year, no computers. Honest, no computers and they walk in to a company and they expect them to remember what we taught them two years ago, they don’t and the guys actually told me that – there’s no time in the third year to learn how to do it.”
The integration model was not covered in the interview with Cherie, however there were findings for the PSI and the implementation process from the interview with Cherie, presented below in section 4.2.8 and 4.2.11.

### 4.2.4 Focus group 1: Integration model findings from Adel, Alvin, Amy and Andria

Although the group stressed the urgency of a process of integration of ICT and accounting education there was concern regarding teaching tools used currently with no integration of accounting software into the classroom. The moderator proposed that that the ‘T-account tool’, a teaching tool, be discussed as the general ledger in accounting software does not report the information in the same format. Adel suggested that the T-account tool be maintained in the classroom as it would continue to add value in explaining and fixing errors, and explaining basic concepts and the processing in the general ledger. There was strong affirmation in the group by all members that the use of the T-account teaching tool be kept to support the lecturer: “I cannot see the problem with teaching T-accounts ... you can’t do away with it,” said Andria. Alvin explained that he used the accounting equation to explain concepts and did not use the T-accounts specifically to show the effect of the “plusses and minuses” in the general ledger. Adel continued to support the use of T-accounts as a teaching aid: “I just find that it is useful to use the T-accounts for the plusses and minuses to be on the right side.” Amy stressed that the students must learn the posting concept: “it’s very easy to lecture using the T ... you’re talking about this plus and minus thing - they must know on which side it goes - that is something they must learn.” Adel then challenged the apparent consensus by suggesting that the system does the processing and asked why it should be necessary for the student to understand how the system operates when: “the system does it for you.” Adel then explained that although the system processed the information based on the accounting principles and concepts the student still needed to understand and see: “where it’s going to be on the balance sheet or the income statement.” There was strong support for the continued use of the T-account teaching tool, even though the processing was done automatically on accounting software. The group claimed that this teaching
aid in accounting be maintained for its use in explaining accounting operations in any accounting system.

The group also confirmed that the integration should take place over all three years of the diploma, which led to a proposal that a higher level program be adapted rather than the one currently used in the degree for this to be practically feasible. A higher level program was explained as being a software package that would facilitate the addition of other finance-related applications for use in the second- and third-year levels of the diploma. The finance-related applications that could be added on are also known as ‘add-on modules’ and would then also be used for enrichment of other subjects in the diploma, such as costing, management accounting, auditing and taxation. They agreed that the students needed to be skilled in a more powerful software package for better flexibility and adaptability of graduates in industry. The group affirmed that there should be cross pollination between subjects, thus creating a lesser degree of segregation in the students’ knowledge for a more comprehensive and complete business as graduates.

4.2.5 Focus group 2: Integration model findings from Bonita, Bella and Betty

This group supported the integration model when all agreed with Betty: “You need to know the program very very well until you get this into the classroom because you have to adapt the classroom to what’s happening in the program and not the other way around because you can’t integrate the program into what’s happening in the class.” The lecturer needed to understand the program and adapt their pedagogy as the accounting software processing cannot be adapted for the classroom.

Betty expressed concern that knowledge of accounting system operations must not be lost, even though the processing was being done on the system, as it is important that the student understand how the system operates: “I understand ...T accounting is not in the software but you know that the program will do it for you but you need to know the theory behind it to be able to understand the program as well. So if you limit the theory, I'm just scared
that they’re going to not focus on the theory and just think okay the program is doing it for me anyway so I don’t have to worry.” Bella supported the notion that the students needed to understand the theory to be able to follow through with its application on accounting software: “Give them homework when you teach the theory in the class and they must take that theory and they must go and apply it.”

4.2.6 Focus group 1: PSI findings from Adel, Alvin, Amy and Andria

Although the group iterated that the integration of ICT and accounting education be urgently adapted, Amy believed that lecturers needed to adopt their pedagogy to ICT as ICT cannot be adapted: “I think it is going to be a learning curve for us as well now changing our whole approach to lecturing.” Alvin stressed that the lecturers needed to be trained first for them to be able to change their pedagogy: “You teach the lecturers and the lecturers apply what they have been taught.” Learning by doing for the staff was stressed as important for them to apply accounting software skills, and that the staff interventions be planned and implemented before the integration process commenced for the students. This would then allow the lecturers to prepare the lectures and learning material and facilitate the application of their new pedagogical knowledge. Adel affirmed the priority of staff needed being trained: “That is the first thing we need to do, is to get the staff up to scratch so that they are in fact Pastel-qualified. That can be done now, they must go to Pastel and go through the course and get a certificate and write the exam. Then otherwise you are wasting your time if the lecturer does not know how to use this thing the kids are going to tear them apart.” Amy supported Adel and confirmed that once the lecturers were skilled on Pastel they would need to be taught to present class or teach on the system: “because then we will know how to use the program.”

No distinction was made as to the training of first year, second year or third year lecturers as there was consensus that the integration be done for all three years of the diploma programme. The group affirmed that a software package be chosen that would accommodate add-on modules and consequently be suitable
for medium- to large-scale business entities. The group confirmed that this was necessary for the integration process to be effective in all three years of the diploma and to include other subjects offered in the diploma for which the add-on modules could be used for enrichment of the integration process.

The group affirmed that current pedagogy was too subject-specific, with no link or cross-pollination between subjects, and that the PSI could facilitate this process for staff, particularly if all three levels of lecturing staff were trained on Pastel. There was extensive discussion on the possibilities this created, with examples debated during the discussion. There was strong support for taxation to be included in the integration process. The discussion moved to the subject and costing, including specific examples of wage calculations, stock sheets and perpetual and periodic inventory systems.

There was extensive discussion on the importance of not losing the accounting theory, with Adel claiming that there were practitioners in the industry who had the accounting software skill but little knowledge or understanding of accounting concepts and theory. Adel believed that this resulted in the casting of doubt on the representation of accounting records. There was general consensus that graduates need the accounting knowledge and accounting software skills for a true representation of business affairs, and it was suggested by Adel that these be focused on real-life scenarios. The group affirmed that for the knowledge and skills integration to be effective and real-life they should match business practice.

The current curriculum was discussed, Adel claiming that industry and academics should work together to match the curriculum to industry requirements, thus creating an education environment real-life: “Basically the whole of the third year syllabus they will not use in practice – small chance – very small chance. The ones that need it to convert to a degree if that’s where they want to be. But if we do accounts one and two over three years properly they will be far better equipped to handle accounts three when they get there. I think we should go to industry and say this is what we are doing and what do you think we should be doing and they will say to us that a diploma student - we are not going to use them at a high level.” The group affirmed that for the PSI to be effective the management of change should
include the revamp of the curriculum for the knowledge and skills of the accounting staff and consequently for the students to be as real-life as possible.

Adel suggested that the process be run as a pilot first, then checked to determine if the integration process was the way forward. Andria replied and iterated the urgency of the integration process: “I don’t think we have a choice. We know we are going to do this so why delay, because the students want to do it and they want to do it now, they want to.”

4.2.7 Focus group 2: PSI findings from Bonita, Bella and Betty

The group confirmed their experiences on the degree programme in which Pastel was taught as a separate subject, with no integration with the subject accounting. The principle and concepts that drive any accounting system were not re-enforced in the Business Information Systems (BIS) subject where Pastel is taught for the second six months of the students’ second year of the three-year diploma. Betty claimed that the tasks were primarily deadline-driven, with no deep learning of the concepts or principles of accounting that she was applying in her teaching of the diploma students. Bonita and Bella concurred with Betty as they had similar experiences.

Bonita admitted that current pedagogy was not in line with the real world and that she learnt about application of accounting software from her clients and experience in practice. Betty added that she believed real-life was not the same as the accounting classroom: “...vat and purchases and sales - it was the first month end and I got the bank statement that was the first time I realised that everything happened in one month – doing a chapter [in the class] you have to combine the whole account ...” She confirmed that the timeline of accounting events as taught in the classroom was not in line actual happenings in real life. Bella acknowledged as well that she did not know real-life accounting: “... it’s not like the basics every day ... I don’t know real life.”

The group recognised the necessity to understand how accounting software operates before they could move forward to changing their pedagogical knowledge. They all supported the integration of accounting software with
accounting education, however Betty stressed the necessity that pedagogy adapts to ICT: “You have to adapt the classroom to what is happening in the programme and not then other way around.” They acknowledged that the staff needed hands-on training or the students would be lost. Betty continued to explain that the staff should be trained first and know the accounting software very well before attempts are made to change the staff pedagogy to integrate the accounting knowledge and the accounting software skills.

Bella advocated smaller units of theory and reinforcement of that theory in the application of the software, claiming that this would then build up the theory and the skills simultaneously. Bonita stressed that the accounting textbook cannot dictate the teaching of accounting if it is to be based on real life scenarios. Bella suggested using source documents for the recording of accounting transactions in support of the proposal to get pedagogy in accounting to be real-life. The group affirmed this idea and continued to discuss the use of bank statements tax invoices and other source documents.

Bella supported the moderator’s idea that the students should be taught the set-up of a business on accounting software as well as be able to record subsequent transactions of the business. This would make the integration more real-to-life and match Bella’s experience when she was asked to help with her husband’s books. Bella was affirming the moderator’s idea from personal experience of being unable to set up her husband’s business on QuickBooks as well as record the business transactions without assistance, even though she was an accounting lecturer and a BCom. Honours graduate. I was fortunate to be the moderator in the focus groups and with the motivation to make the PSI and the subsequent integration with the students as real-life as possible I suggested that the students start a business based on a storyline that matched the curriculum. As the business develops and expands its operations, the student skills and knowledge would grow with the business, which would run for three years to match the length of the diploma. The students would operate a bank account and give the business a name. As the sole proprietor changed into a partnership the students would need to record the changeover for the sole proprietor to a
partnership in the business entity. The business would then become a close corporation and then a company in the second year of the diploma.

Betty expressed a concern that the integration process might lose the knowledge in favour of promoting the software skills. The group concurred and suggested that the accounting equation teaching tool used extensively be adapted and that aids be adapted to suit the accounting software and thus be used in the integration process as well as the PSI.

4.2.8 Interview: PSI findings from Cherie

The situation at the time of the interview for the BCom. Accounting students was described by Cherie, their lecturer in BIS. The BIS subject was offered for six months and included is the accounting software package, Pastel partner. The students used a Pastel manual with a compact disc (CD) and registration code to enable them to load the software at home. They had a two-hour contact time with the lecturer, a two-hour tutor class or practical peer class, and the two hours of time remaining in the computer laboratories scheduled as practice time. The Pastel course covered the setting up of a company and recording of transactions up to the trial balance stage. Cherie confirmed there were no add-on modules such as Payroll and the curriculum did not include the setting up of financial statements. The subject was not linked to accounting or any other subject and Cherie claimed: “...well our subject is not so difficult. Imagine competing with accounting and auditing...” She said that the subject was not complicated, that it was a practical subject and that the manual was self-explanatory: “...I think with our subject they don’t take it seriously.” She added that the students who attended class did well.

Cherie maintained that the six months were too few to explore Pastel in more depth than at a basic operational level and suggested that ICT should be in all three years of the degree programme. She believed that the concept of ‘use it or lose it’ applied to the degree students who were exposed to six months of Pastel, saying that the graduates complained to her that they had forgotten Pastel: ...did very well in his honours and he couldn’t remember how to do something and he says to me – he could do it... It’s true about computers - we don’t
use it we lose it ...” Cherie suggested that the subject be linked to other subjects related to *Pastel*, such as taxation.

### 4.2.9 Focus group 1: Implementation findings from Adel, Alvin, Amy and Andria

This focus group agreed that there was a need to train the lecturers first and that the training should not be less than six months. They also believed that each lecturer would need to change his or her pedagogy to adapt to the ICT integration: “I think it’s going to be a learning curve for us as well now changing our whole approach to lecturing.”

They suggested that only one hour of computer practical time would be sufficient, with at least three hours of accounting theory, and stressed that there was a need in the computer laboratories for small groups.

### 4.2.10 Focus group 2: Implementation findings from Bonita, Bella and Betty

Bonita, Bella and Betty criticised the current textbook for not being suitable and affirmed that it could not dictate the pedagogy with the integration of the accounting software. The group also raised concerns about availability of funds and the adequacy of the computer facilities to accommodate integration process. The software should not be limiting or inflexible for all three levels of the diploma and should have the capacity to house real-life scenarios for graduates to adapt easily to the workplace. They claimed that although they supported the urgency of the integration process they expected management to offer some resistance. For the support of management in the integration process it would be necessary to keep open all communication channels.

### 4.2.11 Interview: Implementation findings from Cherie

Cherie said she took steps to ensure that students submitted their own work in the form of assignments by using the last six digits of their student number in the company name. However, she said that it was not fool proof and that she was
experiencing problems with the degree students copying their *Pastel* work and then changing the last six digits in the company name. To overcome poor class attendance, which Cherie claimed was as low as 7%, she started using attendance registers and making a note of the names of students who consulted her. She claimed that attendance was poor as students perceived the subject as easy. She believed the students to be “digital natives” and some were able to teach the lecturer.

Cherie used approximately 15 laboratory assistants in a 200-seat computer laboratory, with assistants chosen from the students who had done well in BIS and who were now in their third year of the degree programme. Cherie used *SycronEyes* as a teaching aid in the computer laboratories. She maintained that ICT facilities were a limited resource and that students were often seen standing in long queues to gain access to the laboratories. Although she believed that the ICT resources were important: “It’s better quality education. You can’t teach how to use a computer if they are not in front of one.” However, she maintains that management were resistant to committing resources for ICT funding.

The findings from each of the three authentication and refinement cycles are presented next. The findings from the second cycle were from the staff buy-in workshop and there were two sets of feedback forms. The gateway workshop was the third cycle. The fourth and final authentication and refinement cycle, the staff orientation workshop, did include findings from the feedback forms and the transcript of the workshop recording.

### 4.3 FINDINGS FROM STAFF BUY-IN WORKSHOP

Attendance at the workshop by the staff members of the department of Commercial Accounting was good, with more than 90% of the staff present. There were two sets of feedback forms, for the personal and the subject group discussion. The findings in each were collated according to question asked.
A. PERSONAL FEEDBACK FORMS

The first question had two parts: Is it necessary to change the way you teach? Why? / Why not?

The main purpose of this question was to confirm staff recognition of the gap in accounting education and whether the staff accepted the need to change their pedagogy and buy-in to the process to close the identified gap in accounting education. A total of 34 feedback forms were received and for the first part of question one 88% responded yes, one maybe and two no. One feedback form was not completed for question one. The recognition of the gap and the buy-in for the need to change their pedagogy was evident.

The responses to the open-ended second part of question 1 confirmed this: “Change is definitely necessary. We need to have students who are more industry ready (job prepared). It is no use having all the knowledge and not being able to use it and apply it. Everything nowadays practically works on computers and we must also change and adapt.” Another response supported this comment: “People are afraid of change – we must adapt to the evolvement of the minds of the students.”

Two staff members stressed that we are part of a global market and therefore there was a need for education to match the market demands. Another concurred in his belief that: “there is a huge gap between what is taught and what is needed in industry.” One response encapsulated the identified gap as well as the need to change: “It’s what the market place demands. S.A. needs more appropriately skilled people and universities has the potential to make a significant impact provided that its qualifications are relevant and linked to the real requirements of the workplace. Everyone wants to be employed at the end of their studies. The question though is whether your studies prepare you for employment. A well trained individual can also bring about innovation in the workplace.”

One response claimed from experience in industry that university graduates were not prepared for the workplace: “I have been in commerce where I have had staff members in my division who have struggled merging theory from
varsity to the actual practical side of accounting software. The two concepts have never officially been linked together.” It was evident that the staff recognised the gap in accounting education: “Computers are used mainly in the business world and students should be equipped...” Various responses stressed that students must have the ability to apply their knowledge, that lecturers need to adapt to ensure that students are ready for the workplace, and that: “... applications must be within practice of the learning to be philosophy.”

Seven staff members stressed the need to keep students interested and enhance their learning experience as this would better prepare them for the workplace. Two believed that current methods of teaching did not match the learners’ needs as they were too focused on content to the detriment of the required skills. Various responses felt that the teaching must be relevant, with most of the staff stressing the need to stay updated with developments, changes and new technologies in order to bring about change in accounting education: “Being older you tend to teach the way you were taught – and that is definitely not appropriate today as the generation we are teaching grew up with technology and that is what they enjoy and how they are stimulated. Teaching needs to tap in with what students want.” Other staff members agreed and said that students were better motivated by technology, as confirmed by another staff member: “The old way - the way we were taught - does not match our learners’ needs. Old way – too focused on content – irrelevant / too far removed from what is needed – daily lives and industry / workplace.”

It was recognised that practical understanding was equally important as theoretical understanding and that with accounting software there would be more time to promote the understanding of accounting concepts and principles rather than waste time on calculations that could be made using the software. Various other staff members stressed the need for accounting education to be relevant to industry and to be in line with technological developments in industry: “more emphasis on computer software use as there is no business that uses a paper based environment which we are currently teaching.” One response
clarified this: “Provide students with more hands-on and real-life experiences. Try to bring the world into the classroom... use real documents for transactions, arrange for e.g., an accountant to come and speak to the students about what he [sic] expects from the clerks when they join a company.”

One staff member maintained that formal studies have no significance if there are no practical skills to be applied on software: “the advantage that is obtained from formal studies is nullified if there is no skills on software.” Another added that there was a definite need in commerce for accounting theory and the practical use of accounting software to be merged. This was again emphasised: “teach the theory while using the software.”

One staff member maintained that current students had also recognised the challenge to upgrade their skills and had done so independently: “… some amount of self-teaching and acquisition of skills and knowledge has taken place already.”

It was clear from the responses that the staff of the department recognised the gap in accounting education and the need for them to adapt their pedagogy to include accounting software so that the students would be better prepared, with both accounting knowledge and accounting software skills.

The second question asked - What kind of help do you need?

Computer training skills for staff and students was supported by 94% of the staff, one response highlighting the urgency of the implementation: “to introduce a computerised system now.” The staff recognised the extensive use of technology in industry and suggested some form of computer training for the upgrading of their own skills to enable them to integrate technology into accounting education: “I need to learn more and be more confident with my computer skills before I can actually teach my students.” They requested alignment and exposure to the current trends in the environment and software for
the staff and the students. One staff member responded that help was needed on assessments of accounting software.

A response was clear on the question of what kind of help was needed: “A lot!
1. How to use the latest technology in changing our teaching methods. 2. Integrating more practical computer-based applications into the curriculum. 3. Hands-on training on whatever package is chosen - accounting...”

One comment was made that the computer should do “the ‘donkey work’ – the arithmetic that the students waste time on. Lecturers must also be trained on Excel / Access in order to maximise the quality time and cut out on the basic calculations.” It was further claimed that the lecturer could then better identify the students’ shortfalls in understanding the principles and concepts. Various other staff members also requested training on Excel.

Specific help was requested with the development of the subject content to be in line with technology and with the exposure to the relevant IT programs in use in industry, as was training on the use of these. Another concurred and requested information on what was being done and needed in industry.

A large portion of the staff, 53%, requested assistance with learning activity design (LAD) for the purpose of the redesigning of existing activities to integrate more practical applications with the theory. Assistance was also requested for the learning outcomes to be clearly defined for the integration to be effective. One staff member requested assistance with being able to lecture effectively to a large group of students in a computer venue. Other staff training needs mentioned were library training, research skills and Edulink training. Edulink is the University’s on-line integrated technology assisted learning program.

Third question on the personal feedback forms – Other needs to assist in you teaching?

Support, professional development and alignment with what is happening in industry were key issues for one respondent.
One staff member highlighted the need: “to ensure that the syllabus be changed to ensure the inclusion of ICT.”

Exposure to other advanced classroom technologies was requested, such as smart whiteboards: “those new whiteboards where you actually save what you wrote.”

One staff member requested that the students receive assistance and training in insightful reading and making concise summaries, as this would lead to more effective teaching and learning.

One staff member requested that there be better communication between lecturers on different subjects to promote a more holistic and integrated approach across these finance related subjects: “Group workshops are requested to ensure all lecturers have the necessary skill and the ability to apply these skills across different subjects - e.g., a tax lecturer must know that the accounting lecturer deals with VAT on the software program.” This would also promote: “learning from each other.”

Various staff proposed the need for proper venues with ICT equipment and staff who could support the software and hardware in the computer laboratories. Another request was for the computer venues to have “individual assist” software. Staff also requested that each member have a laptop with the integration software loaded in order to better prepare for class. It was also requested that the lecture times be structured to accommodate the theory and the application classes.

Fourth question – What type of interventions would you like?

Various staff stressed the need for hands-on training and ongoing support for staff and students. The staff should be trained first in order for them to pick up problems and confusion that may develop in students: “I want to be the student first.” Many staff stressed that workshops and seminars would be vital in the changing of their pedagogy and that all staff should consider re-training if they were not competent on the latest software. They also pointed to a need for a
mentor or expert in the field for one-on-one guidance with the integration process. It was stressed that staff should also have the training necessary to convert their new ICT skill into pedagogical knowledge and skills.

One staff member highlighted the importance of integrating the syllabus with the accounting software. It was recommended that the theory and concepts be covered first to ensure the topics were understood. It was also seen as important that the students be able to understand the workings of the accounting software in order to work independently of it.

Various staff members claimed that it would be beneficial to create situations that students would encounter in the workplace. For the integration to be effective interventions should be an integral part of each subject and ICT should not be presented as a separate subject. It was claimed that the integration start with the first year students and that the process be phased in.

Two staff members believed that there was a need for a community of practice which would facilitate the sharing and collaboration with other staff members in related subjects with other universities as well as industry. This was supported by four staff members, who claimed that the idea of ‘show and tell’ would promote learning from one another.

The fifth and last question - Do you have any other comments ideas or suggestions?

It was seen as important that the student have evidence of the skill acquired and it was suggested that there should be: “Basic skills assistance during student training would be an intervention – this could be part of a reflection and/or continuing assessment – have students build a portfolio as proof of skill that can be handed in with a CV on industry.” One lecturer agreed and suggested that the students should also be exposed to current software as used by the South African Revenue Service (SARS), such as e-filing.

Two staff members concurred that focus alone on the software was not the issue but rather ascertaining the types of key responsibilities that graduate students are
expected to know, and only when this research has identified the pertinent issues should the changes be made to the syllabi. A related suggestion was not to change all the modules at once but to ask industry which skills were needed and rank these in order of importance.

It was suggested that the same lecturer teach the theory and the practical sessions for continuity, but that the theory classes and practical classes be held in different venues. A further suggestion made reference to the support system that would need to be in place for the lecturers, i.e., tutors and laboratory assistants, and that these should be sourced from competent students.

A comment noted on the feedback form recommended that the staff and students be aware that the software is the tool and not the focus in education.

A concern raised was that some lecturers had not worked in accounting practice, which it was claimed would make it difficult for them to teach an integrated accounting system.

Another comment received was that the implementation of the integration should commence as soon as possible and should be considered even at school level. It was also suggested that the training should be made accessible to the alumni of UJ in order for them to take part in the improved system and use the system in industry.

Staff members who were also part of management raised concerns related to the management of the implementation:

- How are we going to change our assessments?
- How do you manage such a big change in terms of leadership and support to be provided?
- How do we identify additional resources required, such as lecturers, computers and printing facilities?
B. SUBJECT GROUP DISCUSSIONS FEEDBACK FORMS

First question: Do you see your subject integrating with accounting software, why? / why not?

The accounting 1 subject group reaffirmed the need to integrate with accounting software as the students would be better prepared for the workplace.

A yes response was noted for the accounting 2 subject. In the accounting subject the benefit of integrating with accounting software was that high volumes of transactions could be processed in a limited time span allowing for consolidation of theory and skills through repetition for the students.

For costing 1 the integration with accounting software was seen as possible, but to a lesser extent than accounting. It would be beneficial for the students to see the costing and accounting principles being integrated, thereby enforcing the accounting principles.

The integration for the costing 2 subject was seen as possible only sometimes as the costing principles could be reinforced on an Excel spreadsheet.

The internal control and code of ethics subject group answered yes for this question, but they saw the integration as limited to auditing around the computer for the first year. However, for the third-year students it was suggested that auditing through the computer could lead to closer integration with accounting.

For the Taxation subject group, the respondents supported integration with accounting software for the purposes of calculating the applicable taxes and unemployment deductions like VAT, PAYE, UIF and the skills development levy as all the information required for these calculations would need to be derived from the accounting software system, making this learning very much real-life.

The Credit Management subject group maintained that integration with accounting software would be possible to a limited extent only, as only certain aspects of the curriculum contained accounting principles.
**Second question: How do you see your subject integrating with accounting software?**

The Accounting 1 subject group claimed that the accounting software should be an integral part of the syllabus and that the teaching of the accounting theory should be done first and then applied practically.

For the Accounting 2 subject respondents suggested that simulated case studies should be used to integrate the accounting software.

Costing 1 suggested the creation of manufacturing companies and the recording of costing-related transactions, such as material, labour and overheads. They also suggested that the inventory management system could be integrated as accounting software specifically provides this application.

The integration for the Costing 2 subject was seen when more add-on modules were used, such as the manufacturing module or the business intelligent system, which provides for ‘what if’ scenarios used in decision making techniques.

The Internal Control and Code of Ethics subject group answered that the audit of the sequence of documents credit limit testing authorisation policies, and that other tests for internal control could be carried out on accounting software.

The Taxation subject group suggested that the correct processing of VAT transactions could be emphasised for the necessity to complete the VAT 201 form correctly. In addition, the recording of the payroll would lead to the correct calculations on the PAYE, UIF and skills development calculations.

The Credit Management subject group maintained that the accounting modules should be the same for all the diplomas, and therefore the students would be exposed to the accounting software as Accounting diploma students.

**Third question: How do you get the students to engage with accounting software?**

The subject replies were generally applicable to all subjects:
• The integration would not be textbook learning and that hands-on practical application was needed.
• It must be made part of the subject and not separate, in order for the necessary attention to be given to the accounting software.
• There should be marks awarded for the application work done on the software to ensure the correct levels of skills are acquired.
• Exercises should be done manually then repeated, using the accounting software.
• The costing lecturers suggested that the students create a fictitious company, manufacture a product and do all the accounting related entries on the software.

Lastly: Do you have any further comments or suggestions?

It was suggested that students do a computer literacy course before using the accounting software.

It was also suggested that certain calculations and reports that cannot be done on the accounting software be done on Excel and then processed on the accounting software if necessary.

Having concluded the findings from the staff buy-in workshop, the transcripts from the third staff gateway workshops are analysed next.

4.4 FINDINGS FROM THE THIRD STAFF GATEWAY WORKSHOP

The purpose of the management workshop as stated by myself in the workshop was to ensure that the staff and Pastel representatives’ ideas be merged to ensure that the integration of accounting and Pastel can move forward as smoothly as possible.

The purpose of the management workshop as stated by the management of the department was to ensure the hands on application of Pastel integrated and embedded with knowledge in the accounting diploma, and only other diplomas
doing the subjects Financial Accounting 1 and Cost and Management Accounting 1 in 2011.

The purpose of the management workshop as stated by the Pastel representatives was: “the meeting of the needs of the University in terms of making Pastel satisfy the student needs and the curriculum ... and that the features we use are going to address what is actually needed by the university from Pastel and ... the schedule of the trainers and the training plan…” The one Pastel representative, also a former student at UJ, supported the implementation and expressed his view of closing the gap through the implementation of the higher level package of Pastel Evolution as: “a great idea because the new world of Evolution as ERP being a new system is where every new accounting company is going. Now as a student having this exposure at such a level already gives you a big step into getting a job ... it gives you an added advantage to go out into the market.”

There was a Pastel trainer who would be facilitating some of the hands-on training for the staff, and a lecturer to see how Pastel could be integrated in the Cost Accounting subject. This lecturer was also a member of the management team of the department.

The agenda was discussed and presented. Below are findings of each item.

**Agenda for meeting between management and Pastel on 5 May 2010**

1. **Purpose of orientation PSI**

The purpose of the orientation workshop held on 10 May 2010 was to explain the process used to implement the integration model and the PSI using Pastel Evolution. It was decided that the features of Pastel Evolution would need to be highlighted to ensure staff buy-in on the higher level of accounting software chosen for the integration. It was also important to recognise and accommodate the needs of the staff in the implementation process and to identify the project
leaders. Management stressed the importance of the buy-in of the staff for the implementation of the PSI which was to commence in the second semester of 2010: “... so we must have a very practical, strong, positive approach.”

2. Features of integration model

The integration model was discussed in detail with the Pastel representatives, and it was emphasised that the model was going to be used in all three years of the accounting diploma in Financial Accounting 1, 2 and 3. The Pastel representatives clarified their understanding: “so you are going to reinforce these four things repetitively in the three years ... focus on specific things more repetitively.” I replied that the four rules would be reinforced every time the students went onto the system and that these four rules would ultimately become second nature. They agreed: “... when you reinforce it every time it becomes embedded knowledge. Like second nature.” I explained further that once it becomes embedded knowledge one can reach a higher level of thinking and be set free to do what one needs. I explained further that the integration model was like a roadmap that had to be fundamental throughout: “because in accounting you can't build if your foundations aren't solid.” They agreed: “... also that foundation builds confidence.” The Pastel representatives said that we should distribute the model as hard copies for the students to reference with ease.

3. Features of Pastel

It was agreed that the features of Pastel Evolution, the core module, be highlighted as well as the features of the add-on modules. The advantage of using a higher level accounting software package, besides the marketability of the graduates, was the add-on modules that could be integrated in other finance-related subjects in the diploma, such as auditing, management accounting and taxation.

4. Features of PSI – main focus for feedback

Teaching and learning and the integration of Pastel in the PSI were to be as real-life as possible. It was recommended that the staff follow a storyline and start a business as this was the plan to present to the students in 2011. I suggested that
this would broaden the staff perception from academics to business people. The Pastel representatives agreed and suggested that the staff: “take their lives as an accounting game and ... start collecting their slips and bank statements ... to see what’s happening in their lives for the past three months.” I agreed that if the staff could be more exposed to real-life accounting and think like business people they would be better lecturers.

Another important aspect for the orientation workshop was to determine the staff needs to training on Pastel. It was explained that Pastel Evolution was so different from Pastel Partner that it would probably be necessary to train all the staff. It was also agreed that the staff should be asked if they required to be fully trained on Pastel Evolution or if they required a refresher course only as it was to be focused on their needs and their buy-in.

The structure of the PSI was discussed and consideration given to training the staff in subject groups. I confirmed the importance not only of obtaining their buy-in to the process but also confirming the importance of staff commitment to and engagement with the training. All agreed and it was stressed that the PSI should be structured to allow flexibility for staff timetables and that there should be recognised milestones of achievements in the structure of the PSI.

5. Structure of meeting on Monday 10 May

The agenda for the orientation was discussed and it was agreed to include:

- Information on the Integration model and PSI and features of Pastel Evolution
- Feedback forms to be completed during presentation for the identification of the staff training needs for Pastel core or a refresher course
- The feedback forms to include the nomination and motivation of project leaders
- The forms should facilitate the identification of project leaders
6. Practical implementation considerations

It was agreed that each staff member be given a laptop, Pastel CD and manual. It was suggested that the intervention be used as an opportunity for the facilitation of the course material set-up and design for 2011. Also discussed was the training of the students to be laboratory assistants and tutors.

7. Feedback forms and information packs for Monday 10 May

The staff handouts were discussed and Pastel representatives agreed that they would provide brochures and details of Pastel Evolution for all the staff. The information packs was to also include the new curriculum of the Diploma in Accountancy feedback forms and the integration model.

4.5 FINDINGS FROM STAFF ORIENTATION WORKSHOP

The orientation workshop was recorded and transcribed and the findings presented in two sections. The first part is the presentation of the workshop and the findings from the discussion during the workshop. The second part is the findings from the feedback forms. The information packs were distributed and the agenda presented. In the introduction is was stressed that the department was the first in South Africa to embark on an integration process of accounting software into accounting education and that we should see ourselves as pioneers. The purpose was explained as being primarily to close the gap in the accounting graduates’ skills and what is expected in the accounting practice marketplace. The integration model and the process to close the gap diagrams were projected onto the screen. The representation to close the gap was presented as follows in Figure 4.1 below:
It was explained that the process of the PSI was for the staff to develop their skills on *Pastel Evolution* and to work through the integration model for them to better skill the accounting students to produce top graduates. It was emphasised that the PSI would need to work through the integration model. The purpose thereof was to reinforce the rules in order for them to become embedded knowledge, and with these operational thinking skills firmly in place the students would be able to perform a much higher level of thinking. The operational skills become second nature and build the confidence to perform these more complex operations in an accounting system. This was likened to a person needing to be able to drive a car confidently before an advanced driving course could be considered. Accounting software has the added advantage that the feedback of an operation performed on the system is immediate, which facilitates repetition until the desired result is achieved. The integration model was presented as follows in Figure 4.2 below:
It was emphasised that the integration would be as real-life as possible and that a storyline should be developed to accommodate the newly changed curriculum.
The student would start a business as a sole trader and then progress to a partnership in the first year. In the second year the business would convert into a close corporation and then a company. The company activities would then proceed into the third year and there also curriculum would be integrated into Pastel Evolution. The operational skills would become embedded with the development of the accounting knowledge throughout the three years of the diploma. This supports the concept of ‘use it or lose it’. The staff members were given the opportunity to discuss the intended process and comment on it and the integration model on the feedback forms.

A concern was raised about the alignment of Costing and Financial Management 1 into the same story line as Financial Accounting 1 with regards to the timing of the topics in the two different subjects. It was explained that the financial accounting integration was imperative and would need to be a 100% integration of accounting knowledge and accounting software skills. The other financial subjects would need to buy into the integration as best as possible.

The comments from the 34 staff members from the 34 feedback forms on the integration model and the design of the programme to close the identified gap in accounting education are summarised below.

- 20% of the feedback forms had no comments and 18% of the comments received raised concerns. 62% of the comments received were positive. The concerns raised included comments of not being able to foresee how subjects such as Auditing and Cost and Financial Management would integrate with Pastel accounting software. Staff members also raised issues of there being sufficient resources in the computer laboratories, timetable changes and the timing of the implementation. The positive comments were supportive of both the process to close the identified gap and the integration model and included the following on the benefits for the graduates:
  - “Would assist as students would be able to visualise end product”
  - “Agreed a hundred percent. After completing the diploma the graduates should become successful bookkeepers/accounts..."
which would mostly entail Pastel (not sure why the integration hasn’t happened sooner)”

- “It will make the students more attractive in the job market. Need lots of support and training for lecturers”
- “…suggested route supports ‘learning to be’.

The Pastel representatives were introduced and the features of Pastel Evolution and the add-on modules presented to the staff. Their presentation included the position of Pastel Evolution as a product on the market and they maintained that there was no other university, definitely not in Africa, that was attempting this integration process. The staff asked the Pastel representative why the Pastel in some schools was not good enough for tertiary education, especially in the first year. They claimed that the first year of the diploma at university was like the final year at school for accounting. The reply was that Pastel Evolution was for a higher level of thinking. In tertiary education the thinking should be in line with Enterprise Resource Planning (ERP) and the accounting software to match that level was Pastel Evolution. The question then was whether the students who worked with Pastel at school would be at an advantage. Another comment was made emphasising the importance of the computer being only a tool: “I just want to say that it’s not the tool it’s how you use it ... it’s the learning activities that are important...”

The staff members were given the opportunity to indicate what their training needs were on the feedback forms. It was clarified that Pastel Evolution was not the same as some staff members had used before as Pastel Partner. It would be easier for those who had used Pastel Partner to convert their skills to the higher level Pastel Evolution software. The staff members indicated whether they felt that they needed the full training, a refresher course or no training at all. One staff member did not want to embark on the training as he felt he was not a mainstream lecturer in accounting. There was only one staff member who felt he did not need the training as he believed that his training in Pastel Partner was adequate. The majority, 76%, wanted to be fully trained in Pastel Evolution. Regarding just the refresher course, 18% felt that it would be sufficient for them.

The staff members were keen on the following add-on modules:
• Payroll – 86% supported
• Fixed assets – 76% supported
• Multi-currency – 76% supported
• Job costing and manufacturing modules - 73% support
• Auditor module 71% support
• Customer risk and customer account consolidation - 62% and 53% support respectively

Other than Pastel core or add-on modules, 18% of the staff requested that there be training on advanced Excel, and 4% of the staff requested learning activity design (LAD) training.

The design and features of the PSI were discussed next. Each feature was discussed and followed the headings of the feedback forms, which were:

• the staff needed to commit and engage
• the training would in as far as possible match their individual needs
• there would be a safe and supporting environment
• their knowledge would be respected and would be integrated to form new knowledge and skills
• their active involvement and collaboration would promote learning from each other
• direct the tasks to achieve the goals or solve a problem
• activities will have real-life evidence
• there would be evidence of integrated learning

The practical implementation considerations were discussed and the staff informed about the structure of the theory and practical classes. Also discussed was the plan to train the tutors, that the PSI were to be structured and that there would be deadlines and achievement milestones in the training. Each of the staff members would get a Pastel CD and manual for them to practice away from campus. This would provide the staff with a degree of flexibility and allow them to practice on Pastel, which is necessary for skills development. There was one question on the feasibility of on-line assessments for 2011, to which I replied that
they would not be online but that there would be a necessity to provide evidence of the integration in the written assessments.

The staff members were asked to complete the final part of the feedback form on which it was possible to put themselves forward as a project leader with a short motivation.

Under the last section of the feedback forms, for the project leader’s comments or commitment, 10 comments were received, all expressing interest and commitment to the prospect of being selected as project leaders.

The design of the programme to close the identified gap in accounting education and the integration model will be discussed in the next two sections of this chapter, presented as findings. The integration model was engineered to provide a means of integrating accounting software and accounting education. The design of the process to close the identified gap includes the integration model and the planned series of interventions and I contend that the three innovative designs are supportive of each other and work together as a whole. In my opinion the sum of the whole process is greater that the individual three parts when the three work together in the evolution of accounting education. I argue that the process facilitated by the iterative cycles of design-based research and cultural-historical activity theory promoted the curriculum change with a focus on the incorporation of technology in the higher education arena. The iterative cycles of this study facilitated the events which led to the buy-in of the staff and management and consequently the clarification of the need to change the curriculum.

4.6 THE INTEGRATION MODEL

The integration model is a combination of accounting education tools and essential rules and principles represented in any accounting topic, and the same rules and principles which govern any accounting software. The PSI and the integration model originated from separate designs and innovations but must be interdependent for the integration process to succeed.
In a response to a change in epistemologies and pedagogies based on the observation of critical discrepancies between education and best practice, I developed an integrated model of accounting education tools which proved to be useful scaffolding in the understanding of accounting principles and concepts. These accounting system principles are supported and upheld in the accounting software, which does not contradict any of the basic operational procedures on which all accounting systems are based. The engineering of the integration model followed four processes, the first of which was to encapsulate the four processes of an accounting system of input, process, store and output functions. The second was to formulate a guide or a map of the accounting system, the purpose of which is to assist in the need to navigate and find a way through the accounting system. The third task was to conceptualise a basic set of four rules as the cornerstones of the science of accounting and the final process was to integrate the four accounting processes and the four rules and provide a link for each to the accounting software principles. The four processes have been colour coded in order to facilitate an easier way to see the connection and relationship between the accounting system, the map, the rules and the software processes.

There are four distinct parts to the integration model:

1. the accounting system
2. the map or guide through the accounting system
3. the four rules
4. the integration of the four rules with the accounting system.

Each of the four parts is explained and the integration process clarified below.

1. The accounting system

An accounting system as a whole consists of four operational processes (Figure 4.3, below): An input or recording phase; a processing or posting phase; a storage phase and an output phase. The input phase is colour coded green as this is the access point into the system. The processing phase or posting phase entails the transfer of accounting data into the storage phase and is colour coded
The accounting data is summarised and classified into storage compartments and is colour coded blue. The user is able to ‘communicate’ and read the information that is stored by means of a checklist and other reports. This phase is colour coded yellow.

**Accounting System**

2. The map or guide though the accounting system

The map or guide through the accounting system is a detailed depiction of the accounting system and likened to a road map (refer to Figure 4.4 below) to ensure correct navigation and fostering a general bird’s eye view of all the inter-relationships among the basic elements in an accounting system. Once the type of transaction from a source document has been identified the correct access point can be selected. The source documents depict a cash transaction, a credit transaction to a customer or from a supplier. Adjustments or corrections in accounting normally require no source documents and are recorded through the
general journal. This part of the accounting system has been colour coded green to highlight the input or access function. This is the function by which the accounting data is captured or recorded, is the only access point, and hence the only place where action can be taken to reflect the accounting transactions of a business entity. Hence the colour green, for the ‘go...go...go’ actions.

The red zone and the red arrows depict the processing function by which the transactions are posted to the storage area. The red indicates a waiting function, as a red traffic light, as the system is transporting or processing the information to update the accounting system with the next batch of information that was recorded in the green zone. Processing is the flow of accounting information into the storage areas classified as assets, liabilities and owners’ equity. The flow of information into the storage areas is directed by the rule known as the ‘heart of accounting’.
All the red arrows feed into the storage area known as the general ledger, which is colour coded blue. This has been likened to rivers flowing into the sea. The accounting information is stored systematically into compartments according to its classification as assets, liability or owners' equity.

The output zone has been colour coded yellow to represent the communication function. The user of the accounting system obtains information from the system through various reports either generated from the general ledger or the subsidiary ledgers by which details of the customers, suppliers and assets are stored and the information accessed.
3. The four rules

The third part of the integration model is the four accounting rules that integrate with the four phases or functions in the accounting system. The four rules are the cornerstones of the science of accounting and each must be recognised and applied for the science of accounting to be valid. I have likened the four rules to an atom, which is indivisible and cannot exist without its electrons. Similarly, the science of accounting is indivisible from its four rules and cannot function or exist without all four. The rules are evident in the design of any accounting software and form the basic accounting principles that govern the science of accounting. The rules were identified and categorised into the same four functions of input, process, summarise and classify and output.

4. The integration of the four rules into the accounting system

Rule one links up to the input journals in the green zone and hence has also been colour coded green. The identification of the assets, liability or owners’ equity for each transaction is a key rule for the correct recording in the input phase. Rule two has been termed the ‘heart of accounting’ and colour coded red, which is the same colour for the processing and classification phase. This rule is associated with the processing and classification of all accounting transactions. The processing is carried out by the accounting software, however the accounting data cannot be manipulated if this accounting rule is not understood. The third rule relates to the storage of accounting data as is known as the ‘double entry rule’. The accounting data is stored with a link to the source of funds and the application thereof - hence the double entry concept. The third rule forms the basis for the fourth rule, which is the representation of the double entry concept in the accounting equation rule.

The accounting equation rule has been colour coded yellow as the output function as the financial statements are based on this rule. Figure 4.5 below depicts the fourth part of the integration model.
4.7 THE PROCESS TO CLOSE THE GAP

There were four distinct elements in the structure of the process followed to address the identified gap between the education environment and the knowledge and skills required in accounting practice. The process started when the opportunity to close the identified gap was acknowledged and seized. The PSI was designed to facilitate the procedure, commencing with the staff and management buy-in to the final PSI, in which the staff were re-skilled on the integration of the accounting knowledge and software. It was necessary to work through the integration model to incorporate the accounting software skills with the lecturers’ accounting knowledge for the development of new pedagogical knowledge and skills. The implementation of a new integrated curriculum for all

Figure 4.5: Integration model: rules integrating with the system
three years of the diploma would then make it possible to prepare the accounting diploma graduates for the workplace, which would in turn create the potential for ‘star’ graduates (as depicted in Figure 4.6 below), with integrated knowledge and skills. The design principles clarified in the analysis and interpretation of the findings of each iterative cycle in this enquiry are identifiable for each of the four elements of the process. However, each element is part of a whole process and is an integral and necessary part of the whole of the implementation programme.

**Figure 4.6:** Design of programme to close the identified gap
4.8 CHAPTER SUMMARY

Chapter four provided an exposition of all the findings analysed into the four stages of the study. The findings include the designs of the integration model and the process to close the identified gap in accounting education and accounting practice.

The next chapter presents an interpretation of the findings from all the cycles into the contributing design principles of this study.
CHAPTER 5:
INTERPRETATION OF DESIGN PRINCIPLES

5.1 INTRODUCTION

This chapter presents an interpretation and mergence of the findings from all cycles under each of the four stages of the study. The findings under each stage were filtered and interpreted to identify the principles and ideas that had the potential to be used as generic design principles. Those identified and recognised are evident in the four stages to which their generic characteristics are highlighted and linked.

The conceptualisation of the four stages of this study initiated by my personal iterative cycles (PICs) was substantiated through the process of cycle 1, the purpose of which was to collect data from the focus groups and interview to substantiate the PICs. This substantiation cycle, or cycle 1, supported and upheld my claims that were developed in my PICs of data collection from my experience in accounting practice and accounting education. The PICs and the iterative cycles provided an avenue to ensure the staff buy-in and the support and sustainability of the process of implementation from the management of the department and faculty.

The design principles of the stages of the study, the integration model, planned series of interventions (PSI) and the process to close the identified gap were enhanced, refined and authenticated by the three sequential cycles of staff workshops that followed in design phase 3. In my search for solutions to the questions of what, why, how, where and when the identified gap in accounting education be closed, concepts and principles emerged. I have likened the recognition of the design principles to the development of strands or threads of knowledge that can be woven together to form a process for the management of change. It was demonstrated in this study that these design principles, when woven together, formed a process that was practical and feasible for implementation. I contend that it supported the management of change in the
implementation process. These design principles were formed by the PICs and strengthened from the staff contributions from the focus groups, interview and staff workshops. The design principles that were being developed in the sustainability cycle were refined and authenticated to become the design principles of the four stages: gap verification, integration model, the planned series of interventions (PSI) and the design principles for the implementation in the final design phase of this study.

The remainder of the chapter is set aside to describe and clarify these design principles which are presented under the headings of the four stages and are as follows:

Stage 1: Design principles for gap verification and validation

- Recognise the gap
- Recognise the extent of the gap
- Recognise the value in closing the gap
- Recognise the opportunity to close the gap

Stage 2: Design principles for the integration model

- Enrich knowledge with skills
- Support other tried and tested educational tools
- Maintain authenticity and relevance
- Make it friendly, appealing, inviting, accessible
- Empower the user
- Maintain acquired skills ('use it or lose it')
- Support the cognitive process
- Support the knowledge developmental process

Stage 3: Design principles for the planned series of interventions

- Commit and engage
- Promote active involvement and collaboration
- Direct the tasks to achieve the goals or to solve the problems
- Provide activities with real life evidence
• Respect experience and integrate new knowledge and skills
• Recognise evidence of integrated learning
• Provide flexible design
• Provide a safe and supportive environment

Stage 4: Design principles for implementation

• Recognise need for support by management
• Recognise need for support by industry
• Recognise need for careful planning of implementation cycles
• Recognise need for all the above support during implementation

The design principles are presented in the same order that was followed in this study. The gap was verified and validated before the model was constructed and the planned series of interventions were designed before the implementation was planned and proposed. I believe that there are generic properties to these design principles that could be applied to other environments in which a gap has been identified. The generic nature and characteristics of these design principles are such that they can be applied as standalone principles or in any combination to work together as a process for the management of change.

5.2 DESIGN PRINCIPLES FOR GAP VERIFICATION AND VALIDATION

The verification and validation of a gap, need or contradiction between two environments should be carried out first before a process of change is implemented. To aid in the process these design principles could be used as questions:

Is there a gap or need between the relevant environments?

If yes, then what is the extent of the gap?

If the gap is extensive, is there any value to be attained in closing the gap?

If the closing of the gap would be beneficial then the final step would be to find or create an opportunity to close the gap.
5.2.1 Recognise the gap

The first step in this enquiry was to formally recognise and substantiate the gap in the skills of higher education accounting graduates. The skills required by industry were not addressed as there was no integration of accounting software in accounting education. This was supported firstly in the literature and the job advertisement analysis that I conducted and presented in Chapter 1. In the substantiation of my argument I believe it was important for the staff to be made aware of the extensive research that supported the identification of the gap.

Adel, Alvin, Amy and Andria were unanimous in recognising that there was an identifiable gap in the accounting graduates’ skills compared to the demands of the workplace. Alvin affirmed this by saying: “We [Accounting Education] are already behind.” Adel claimed that there were accounting practitioners with no formal accounting education who had acquired the accounting software skills through experience, which at times resulted in the incorrect reflection of accounting data. Adel maintained that the accounting diploma programme integrated the skills and knowledge to match what is used in accounting practice: “then we can better equip them for the job that they are going to do.” Both of these claims were supported in the industry representative’s presentation in the staff buy-in workshop, at which he claimed that both accounting knowledge and software skills were a current requirement in the workplace for accounting graduates.

At the outset of the discussion in the focus group with Bonita, Bella and Betty, Bella told of her experience of industry from the recent perspective of a graduate with industry. She initially thought she could cope in accounting practice, “...it can’t be that difficult,” and took on extra work in addition to her full-time lecturing work. Bella acknowledged her embarrassment when questioned about being a lecturer in accounting and yet not being able to do even a ‘normal sales’ or basic transaction on the accounting software. Bella explained: “I asked for his help and he asked me how come I didn’t know this - sales and everything. I said to him that I studied BCom. Accounting and he asked me what I was doing now and I said that I was lecturing accounting. He said how can you lecture accounting when you can’t do normal sales on a program? So I
laughed and I was embarrassed because I'm lecturing accounting ... it was shocking actually.” She was comfortable in the group to acknowledge her shortcomings in her accounting software skills and recognised a definite gap in her knowledge and skills when she conceded: “it’s like I don’t know real life.”

Bonita then related her own experience with accounting practice. She also recognised an identifiable gap in what was being taught in higher education compared to what industry expected of an accounting graduate, as there was “definitely a real lack from real life” compared to accounting pedagogy. This led Bonita and Betty to reflect on their respective educations, and they realised that they all had the same qualification, which included six months of *Pastel*, which was not integrated in any way with the financial accounting subjects. Betty also admitted that she did not even remember what they did in *Pastel*, that there was no integration with the financial accounting subjects and that the module was task- and deadline-orientated: “you have these specific tasks with deadlines – what I found is that you want to just get to the end - just get it done”. She also confirmed that: “we can’t even remember what we did. We might have done the stuff [*Pastel*] but I can’t remember”. All these claims were confirmed in the interview with Cherie, the lecturer in the degree programme, who admitted that the module was, “not so accounting-orientated and very basic operational”, and that there were no add-on modules like *Payroll*. Cherie believed that the gap in skills and the current exposure on the degree programmes is not enough to close the gap in the skills required in the workplace: “I've said this before, what I would like to see is for them to be learning to do computers in the first, second year, excuse me, third year no computers. Honest no computers and they walk into a company and they expect them to remember what we taught them two years ago, they don’t and the guys actually told me that – there’s no time in the third year to learn how to do it.” It is clear from the related experiences that the degree programme with six months of exposure to the operational side of accounting software did not sufficiently address the gap for the accounting graduates. This very basic exposure to accounting software had been offered to the diploma students in the past but was seen not to add sufficient value and had been removed from the diploma programmes with effect from January 2008. The focus groups affirmed
the urgent need in the diploma programmes to adopt a process of integration of accounting software into accounting education.

### 5.2.2 Recognise the extent of the gap

In this design principle the question to be asked is: How important is the closing of the gap to the community of this study? I see the immediate community related to this study as including the staff lecturing in the Accountancy diploma programmes, the applicants for and current students in them, the management of them and the employers of the graduates from them. The gap had been recognised as a lack of integration of accounting skills in the education of the diploma students. As evident from the interpretations of the findings which are presented below, the integration of ICT in accounting education is essential to this community.

I believe that my work experience together with my experience in education acted as an impetus for the commencement of the process of personal iterative cycles (PICs) as presented in Chapter 3, which in turn led to cycles of investigation in literature reviews. The PICs, combined with speaking to people in the accounting industry and my colleagues in accounting education, substantiated my perception of the gap between accounting education and accounting practice. The recognition of the gap as well as the identification of the value of commencing a process to close it by means of integrating accounting software into accounting education was evident in the findings. The one lecturer in his feedback form from the staff buy-in workshop claimed that he had university graduates in his division who struggled to merge theory to the skills required on the practical side in accounting software: “I have been in commerce where I have had staff members in my division who have struggled merging theory from varsity to the actual practical side of accounting software. The two concepts have never officially been linked together.” He recognised the extent of the contradiction between accounting education and accounting practice when he maintained that ICT is used in business and the graduates need to be better equipped for the workplace: “Computers are used mainly in the business world and students should be equipped...”. He also affirmed that accounting
education apply the ‘learning to be’ philosophy rather than ‘learning about’ philosophy: “…applications must be within practice of the ‘learning to be’ philosophy.”

The relevant literature presented in Chapter 1 supports the notion that the curriculum in accounting education is ‘outdated and irrelevant’. My experience in accounting practice and what I taught in the classroom were not aligned to the skills required in accounting practice. The findings of the focus groups and interview supported this contradiction. Andria claimed that by integrating the accounting software skills with accounting knowledge we can better prepare the Accounting graduates for the jobs that they will be doing. Cherie believed that the degree programme, in which there is limited exposure to accounting software but no integration with accounting knowledge, is not enough to prepare the graduates for the workplace. She affirmed that there was no integration with accounting and that the emphasis was for the acquisition of basic operational skills. There was no enrichment of accounting knowledge with the use of add-on modules in accounting software. She believed that by the time Accounting graduates seek employment they have already forgotten their ICT skills that they learned two years previously. This was also affirmed in her discussion with her students after they had graduated and found employment: “… did very well in his honours and he couldn’t remember how to do something and he says to me – he could do it... It’s true about computers - we don’t use it we lose it...” It was evident that for the degree students there was no integration with accounting as they were at times unable to link the accounting software class to the accounting lecture. Cherie claimed that these students had a problem with accounting terminology which is used all accounting software: “and in Pastel sometimes they have a problem with accounting terminology which they shouldn’t have because they are accounting students in the second semester in their second year so they should know these things.”

The focus groups recognised the extent of the gap between accounting education and accounting practice and affirmed the urgent need to integrate ICT and accounting education for the diploma students. Alvin claimed that accounting education was far behind in the use of technology compared to industry. A
respondent in the buy-in workshop concurred when he noted that current students have recognised that they do not have the software skills and some are being proactive in the acquisition of these skills that are in demand in the workplace: “some amount of self-teaching and acquisition of skills and knowledge has taken place already.”

The responses to the open-ended question in the staff buy-in workshop confirmed that change was definitely necessary as the graduates were not ready for the workplace, where most work is done on computers. In addition: “there is a huge gap between what is taught and what is needed in industry.” Another staff member claimed that the way the lecturers were taught with no ICT did not meet the demands of the workplace nor the learners’ needs: “The old way - the way we were taught - does not match our learners’ needs. Old way – too focused on content – irrelevant / too far removed from what is needed – daily lives and industry / workplace.” A staff member in the buy-in workshop claimed that the medium used in accounting education was outdated: “more emphasis on computer software use as there is no business that uses a paper-based environment which we are currently teaching.” Various staff members reiterated the extent of the gap and said that accounting education had to be relevant and aligned to accounting practice with the advancement, developments and extent of the use of ICT. It is also of significance to recognise the value in closing the gap once the extent of the contradiction is acknowledged.

5.2.3 Recognise the value in closing the gap

I believe there are benefits that can be easily measured in closing a gap, but also benefits that are difficult to measure and assign a monetary value. Both benefits that are quantifiable and non-quantifiable should be recognised in the feasibility study for the process of closing an acknowledged gap. An example of a quantitative benefit for the purposes of this study would include that of a graduate who is ready for work and has a very short learning curve compared to the current graduates who probably need more time and training before they are ready for work and productive. Benefits that are difficult to quantify in financial terms are significant and relevant, for example the value of a better quality
educational programme that has the potential to align the requirements of employers to the skills and knowledge of a graduate.

Alvin recognised this benefit of a better quality diploma programme, stating that the diploma graduates would be in more demand by potential employers than the degree students: “and then we get ahead of the BCom. degree students, then we will know more than them. I’m saying we should cover this niche. The industry is going to demand more students from us than them [degree students].” A response received from a staff member in the buy-in workshop maintained that there was value in providing accounting education to the diploma students where the accounting software skills are integrated in accounting knowledge: “Provide students with more hands-on and real life experiences. Try to bring the world into the classroom ... use real documents for transactions, arrange for an accountant to come and speak to the students about what he expects from the clerks when they join a company.” He also saw a need for more appropriately skilled people and universities that have the potential to make a significant impact, provided the qualifications were relevant and linked to the actual requirements of the workplace. He also believed that a well-trained individual could bring about innovation in the workplace: “It’s what the market place demands. S.A. needs more appropriately skilled people and universities has [sic] the potential to make a significant impact provided that its qualifications are relevant and linked to the real requirements of the workplace. Everyone wants to be employed at the end of their studies. The question though is whether your studies prepare you for employment. A well trained individual can also bring about innovation in the workplace.” In both instances it was clear that the staff recognised the value in closing the gap by integrating accounting software skills and accounting education to provide a graduate with an enhanced opportunity to find employment at the end of their studies.

Staff in the buy-in workshop stressed the need to keep students interested and to enhance their learning experience by providing hands-on real-life experiences. The one response encapsulated the adding of value by integrating the skills when the staff member claimed that the advantage of formal studies was nullified if
there were no skills to support the acquired knowledge: “the advantage that is obtained from formal studies is nullified if there is no skills on software [sic].” The notion that formal education be nullified was evident in focus group with Bonita, Betty and Bella, all three of whom were graduates of the degree programme and admitted embarrassment when their skills were challenged in the accounting practice workplace.

The value of closing the gap for the graduates would be for them to have confidence in their skills and knowledge as their competence would be aligned to the real world that they would encounter in the workplace. The recognition of the gap, the extent of it and recognition of the value in closing it should lead to the next design principle, where the opportunity to close it is recognised. The value in closing a gap might necessitate the presence of an opportunity to be highlighted or clarified to the relevant community. The value of closing the gap or the resolution of a contradiction could be of such importance that for an opportunity to become a reality it should be refined or even created, as was the case in this study.

5.2.4 Recognise the opportunity to close the gap

Recognising an opportunity for action, which will lead to the closing of a gap or the resolution of a contradiction, I argue, has the potential to become the igniting force for a process of change to commence. To close an identified gap between the skills and knowledge required by the workplace and the skills and knowledge acquired by an accounting diploma graduate, the community must buy into and actively support the process. The staff buy-in was evident from the discussions in the focus groups, the interview and the feedback from the three workshops, with numerous affirmations that the integration of ICT into accounting education should be urgently implemented.

In response to the question of whether the staff recognised the need to change the way they taught, 88% responded with a clear yes. The staff accepted the need to change their pedagogy and it was evident that they were willing to use the opportunity, with responses such as: “change is definitely necessary; we need the students to be industry ready; there is a huge gap between what is
taught and what is needed in industry; universities have the potential to make a significant impact.” The staff claimed that current teaching was too focused on content to the detriment of the required skills. The staff recognised that people were afraid of change, however they also stressed the need to stay updated with developments, changes and new technologies in order to bring about change in accounting education. One staff member said: “Being older you tend to teach the way you were taught – and that is definitely not appropriate today as the generation we are teaching grew up with technology and that is what they enjoy and how they are stimulated. Teaching needs to tap in with what students’ want.” Some staff members confirmed this urgency when they responded that teaching must remain relevant and match the learners’ needs to integrate ICTs.

The staff appeared to support my findings in the literature in Chapter 1 and 2, when they claimed that the students were “digital natives; that the generation they were currently teaching had grown-up with technology; that technology was what they enjoyed; and that they were stimulated by it.” In the focus group, Andria clarified the students’ willingness to embrace ICTs when she affirmed, “I don’t think we have a choice. We know we are going to do this so why delay, because the students want to do it and they want to do it now, they want to.”

Management buy-in was evident when the curriculum was changed to include ICTs in all three years of the diploma in the subject Financial Accounting as well as other finance-related subjects. The integration in the latter was not to the same extent as the former, where accounting software was to be fully integrated in all three years of the diploma. The intention in the finance-related subjects was to recognise the integration of accounting software without losing focus of the specified curriculum. Although the curriculum was adapted to include ICTs in all finance-related subjects the intention was to support and uphold the integration of accounting software in financial accounting to afford the graduate the opportunity to gain a holistic overview of an accountants’ role in business.

The management of the department and of the faculty supported the Pastel Evolution software. This study supports the use of any software that has the
potential to integrate with all three levels of financial accounting, as well as the possibility to enrich other subjects such as Cost and Financial Management, Auditing and Taxation. The core of *Pastel Evolution* is the software that is integrated in all three levels of financial accounting. The enrichment process of the finance-related subjects as well as financial accounting is anticipated with the core module as well as the add-on modules, which are specifically designed to take accountants beyond the role of ‘bean counter’ into a decision-making one. The add-on modules provide the financial specialist with the capacity for better financial information regarding a wide range of functions in business. This will provide the accounting diploma graduates with a broad spectrum and dynamic impression of a realistic business environment.

The *Pastel* company representatives at this third staff gateway workshop proclaimed their goal as being: “the meeting of the needs of the University in terms of making *Pastel* satisfy the student needs and the curriculum.” It was also confirmed by the company representatives that the complete *Pastel Evolution* package would be available to UJ for integration into the new curriculum and that this would include the core and add-on modules. Their buy-in and support for the integration of *Pastel Evolution* in the accounting diploma was also evident when they claimed the new world of *Pastel Evolution* as an Electronic Resource Planning (ERP) software was where “every new company is going.” They believed that the accounting diploma graduates, with the integrated accounting skills and knowledge, would then have a greater potential for obtaining employment: “a great idea because the new world of *Evolution* as ERP being a new system is where every new accounting company is going. Now as a student having this exposure at such a level already gives you a big step into getting a job. ...it gives you an added advantage to go out into the market.”

The support and buy-in from each segment of the community: staff lecturing in the diploma, the management of the department and the *Pastel* company representatives from industry, was the driving force for the implementation to commence. In my opinion, the design principles relevant to the gap verification and validation process are all relevant and to a large degree sequential. They
follow one another in the order presented here and were all necessary to set the stage for the implementation process to be practical and feasible, and contribute to the successful implementation of a process to resolve a recognised contradiction or close a gap in two or more environments.

5.3 DESIGN PRINCIPLES FOR THE INTEGRATION MODEL

I have described the formation and development of the integration model in Chapter 3, in which it was highlighted that a large contribution of the model was from my iterative cycles. The design and structure of the integration model is presented in Chapter 4, however, the validation thereof was most certainly from the staff and industry interactions in the workshops. The design principles that have been developed were elucidated and refined in the findings of the PICs, the focus groups and interview, and the three staff workshops. I believe the design principles for the integration model are not necessarily a complete and conclusive listing of all possible design principles for an educational model. I contend that they are the most important and relevant findings that support the integration model of this study.

5.3.1 Enrich knowledge with skills

The integration of new skills into a tried and trusted knowledge base should enrich knowledge, but the addition of accounting software skills will need time and effort. The time spent on the teaching and learning of these should reinforce the theory in the knowledge base, not weaken it, and the knowledge support structure must be upheld. The skills will need to substantiate and strengthen the science and the structure of the knowledge foundation. An example is that accounting software updates the accounting records automatically on the selection of the appropriate function key. The teaching and learning of this concept is carried out in detail as it is done manually. An accounting software system completes this function with the selection of one keystroke, however it is an important concept for an accounting student to learn and understand and there was concern raised that an accounting software skill would undermine the knowledge base.
The fear of losing knowledge in favour of the software skills such as the example above was a concern raised in the focus groups. Betty said, “You need to know the program very very well until you get this into the classroom because you have to adapt the classroom to what’s happening in the program and not the other way around because you can’t integrate the program into what’s happening in the class.” Betty’s concern was valid, as she said that focus on the software skill the system would process the transactions which may lead to complacency among students on understanding how the transactions are processed: “but you know that the program will do it for you but you need to know the theory behind it to be able to understand the program as well. So if you limit the theory, I’m just scared that they’re going to not focus on the theory and just think okay the program is doing it for me anyway so I don’t have to worry.”

After extensive discussion on the use of the integration model to integrate the accounting software skills with the accounting knowledge the focus group agreed that the students needed to understand the theory to be able to follow through with its application on the accounting software, “Give them homework when you teach the theory in the class and they must take that theory and they must go and apply it.” The concern that the students needed to understand how the system operated before being able to apply the theory was reiterated in the interview. When the focus groups claimed that the lecturers needed to understand the accounting software and adapt their pedagogy to it I realised that these were probably concerns of all lecturers. In my ensuing presentations at the staff workshops these issues therefore became focal points in the presentation to explain how the integration model supported, upheld and was based on the operational accounting principles and concepts. It was important to explain and show the staff how the PSI working through the integration model would prepare the lecturers to adapt their pedagogy for the integration of skills and knowledge in accounting. On the feedback forms from the staff orientation workshop it was clarified that the staff accepted the notion that the integration model reinforced and enriched the accounting principles and concepts. The staff maintained that the students would learn the theory in class and apply in using Pastel; that the lecturers’ could teach the theory while using the software and that the students
would gain more knowledge and experience with the integration of accounting knowledge and skills.

5.3.2 Support other relevant tried and tested educational tools

Current teaching tools should be evaluated and the accommodation thereof should be considered, especially in the initial integration process in which new educational tools have yet to be developed. I believe that while lecturing staff are adapting their pedagogy the assurance of the support of trusted teaching tools is necessary. An example in the teaching and learning of accounting theory, the ‘T-account tool’, is used to explain the ‘heart of accounting’ and is employed extensively in the classroom. It was discussed in the focus group as the general ledger in the accounting software does not display or report the accounting transactions in the same format. Accounting software uses the narration format to present the information in the general ledger, with the transactions following a story type presentation in which the balance is updated after each transaction. The T–account format separates the transactions into the effect that each transaction will have on the balance of a particular general ledger account. The balance of the general ledger is not updated after each transaction, as it would be on accounting software, but requires an additional manual calculation. The accounting information is presented differently on accounting software, however there is no contradiction of any accounting concept principle and the use of the T-account teaching tool is supported and accommodated in the integration model.

There was strong support for the continued use of the T-account teaching tool, even though the processing is done automatically on the accounting software. The students needed to understand the operations of the software: “I cannot see the problem with teaching T-accounts. ...you can’t do away with it, ...I just find that it is useful to use the T-accounts for the plusses and minuses to be on the right side.” Amy stressed that the students must learn the posting concept: “it’s very easy to lecture using the T... you’re talking about this plus and minus thing - they must know on which side it goes - that is something they must learn.” The focus group believed that the T-account tool be maintained in the classroom as it would continue to add value when explaining
basic concepts and the correction of errors in the capturing of the accounting transactions. The ‘heart of accounting’ in the integration model was refined to support the T-account concept as an important and tried and tested teaching tool.

5.3.3 Maintain authenticity and relevance

An important design principle is that the skills to be incorporated in an educational environment are relevant, authentic and real-life. This is a principle that must be evident for the staff, the management and for industry to buy into a process of change. The skills will need to add value to the education of a graduate, thus ensuring he or she is better skilled and ready for the workplace.

The staff recognised that the integration could not be textbook-driven and that the skills should not be treated as a separate subject for the integration to be as real-life as possible. One staff member wrote on the orientation feedback form that the integration model supported the ‘learning to be’ philosophy recently adopted by UJ. It was recommended that the integration take place in all three years in the financial accounting subject, which led to the redesign of the curriculum to accommodate the integration of accounting software skills in the first, second and third years of the Financial Accounting syllabus. I proposed, and it was accepted, that the development of a students’ knowledge and skills be in line with the real-life development of a business entity, which meant the implementation of the redesign of all three years of the Financial Accounting syllabus.

The staff supported the notion that there be crosspollination between the finance-related subjects, thus ensuring a lesser degree of segregation in the students’ knowledge for a more comprehensive and complete business sense for the graduates. This would also be in line with real-life expectations of potential employers in industry, and led to the inclusion of ICTs in other finance-related subjects in all three years of the diploma, including Cost and Financial Management, Auditing and Taxation. These subjects are very closely related to accounting, as they draw information from the accounting system for the provision of good information in the use of decision-making.
The accounting software chosen then had to support the integration of skills in all these finance-related subjects. A higher level of accounting software would facilitate the addition of other finance-related applications, known as ‘add-on modules’, which would then be used for the enrichment of the finance-related subjects and so ensure a more holistic business sense for the accounting graduate. A large complement of the staff of the department, over 80%, indicated that they needed training on the core module as well as the add-on modules. It was evident that the staff supported the real-life integration in all three years of the diploma, including the finance-related subjects, as they wrote on the feedback forms that the graduates would be more employable in the workplace.

5.3.4 Make it friendly, appealing, inviting, accessible

I believe that an educational model should be friendly appealing and invite the student to explore what is being represented by the model. The model should be made available and accessible to all the Accounting diploma first-year students. In the design of the integration model, as explained in Chapter 4, I used colours to explain the map or guide through the accounting system and, using the same colours, linked the four rules to it. More user-friendly and appealing to the eye, the colours relate to the function, for example, green for the input function to signify the ‘go’ or proceed function of a traffic light. This is where all accounting transactions are recorded on the accounting system and where action is required. Another example is the use of the friendship colour yellow, as friends need to communicate to keep a friendship strong. For each colour and function there is just one rule, which adds to the appeal of the integration model.

It was suggested by the Pastel company representatives who found the integration model to be appealing and inviting that it be made available as a hard copy for the students. This was laminated and distributed to all first-year Accounting diploma students to ensure accessibility. One staff member commented that the colours guided her on the accounting system tree; it identified the different transactions in the system and gave her a better understanding of the process. Overall, she found the integration model useful and easy to use.
5.3.5 **Empower the user**

The integration model should empower the student to make a connection between the knowledge and the skills, which support one another so that there is no divide in the translation of them once the graduate is in the workplace. The integration model prepares the student to make this link in industry, and 65% of the staff members who completed the feedback forms in the orientation workshop supported it. The one staff member believed that the integration model would assist the students to visualise the end product whilst another thought that it would provide a way of changing how accounting knowledge was taught: “**Basic skills assistance during student training would be an intervention – this could be part of a reflection and/or continuing assessment – have students build a portfolio as proof of skill that can be handed in with a CV on industry.**”

The laminated integration model provided to the first year accounting students had a graphical depiction of the integration model on the top side, and on the reverse a comprehensive explanation of the guide or map through the accounting system and the integration of the accounting rules into the accounting system.

5.3.6 **Maintain acquired skills (‘use it or lose it’)**

I believe that the concept of ‘use it or lose it’ is important to maintain an acquired skill, which needs to be developed in line with the expansion of the knowledge in the integration of ICT and theory. The notion was supported in the focus groups as well as in the interview, where the staff said they had lost Pastel skills when it was only used for six months in a module in the second year of the degree programme. This was verified in the interview with the lecturer of the degree programme when she claimed that some of the graduates gave her feedback on the Pastel training as inadequate to prepare them for the workplace. Cherie also maintained that the Pastel training should be included in all three years of the degree programme: “**... It's true about computers - we don't use it we lose it...**” The focus groups affirmed that the integration should take place over the three years of the diploma. The accounting software program chosen had to be of
a high enough level to ensure development of the skill was in line with the development of knowledge over all three years of the diploma.

The consideration of suitable accounting software would need to facilitate the real-life scenario integration in all three years of the diploma as well as the buy-in of the finance related subjects. The accounting software needed a core module to facilitate the accounting function in all three years of the diploma. This accounting function found in the integration model fuses accounting education and the accounting software from input, to processing, to storage and to output phases of the accounting operations. To facilitate the buy-in of finance-related subjects the software needed the facility of what is known as add-on modules. The core module is embedded in all three years of financial accounting and at the same time needs to be sufficiently flexible for use in all three years of the diploma with the add-on modules. This would then facilitate the ‘learning to be’ for a more holistic and interrelated view of business. The scope is wider with the add-on modules and it was important that they enrich and complement the syllabus and not replace it. Although the Pastel Evolution package was chosen, the findings and design principles of this enquiry are not limited to any specific accounting package. I nevertheless maintain that the package be of a level that is feasible to implement in all three years of the diploma as well as included in the enrichment of other finance subjects through the use of add-on modules.

5.3.7 Support the cognitive process

I maintain that the integration model supports both the cognitive process dimension and the knowledge dimension, as proposed by Anderson and Krathwohl (2001). The integration model was discussed with the Pastel representatives in the third staff gateway workshop, and they required clarification that the four rules that form the basis of the integration model would be reinforced repetitively in the three years of the diploma. I confirmed that as well as in the ensuing staff orientation workshop this would be the case and that the four rules would become second nature for the students, after which they clarified their understanding: “so you are going to reinforce these four things repetitively in the three years... focus on specific things more repetitively.” I replied that
the four rules would be reinforced every time the students accessed the system, and that these four rules would ultimately become second nature. They agreed: “when you reinforce it every time it becomes embedded knowledge. Like second nature.” I explained further that once it becomes embedded knowledge then one can reach a higher level of thinking and be set free to do what is necessary. With embedded knowledge, the students may then reach a higher level of thinking and be able to apply their knowledge and skill to analyse and evaluate problems in the accounting system and find ways to correct errors if necessary.

The operational skills become second nature and build the confidence to perform operations in an accounting system. Accounting software has the added advantage that the feedback of an operation performed on the system can be immediate, which facilitates repetition until the desired results are achieved. The trial balance, for example, which is produced automatically on the accounting software and is a checklist of what is stored in the general ledger, can be viewed after each transaction is processed. This creates an opportunity for remembering, understanding and applying the rules which govern the accounting system. I also maintain that the analysis dimension, which is the next step in the cognitive process (Anderson & Krathwohl, 2001), is encouraged as the student is able to analyse the effect of each transaction which in turn promotes from the outset a further ability to analyse more onerous transactions. This reinforces the accounting system rules and fosters understanding of the accounting principles and concepts on which it is based.

5.3.8 Support the knowledge developmental process

The cycle of acquisition of new knowledge and the application thereof is regular and balanced between the amount of time allocated for the theory classes and the practical classes in which the students have an opportunity to apply the new knowledge about the accounting software. The subject has been structured so that every week they have two hours of accounting theory and two hours of working on the accounting software in a practical session in a computer laboratory. The subject, Financial Accounting will be presented as such in all
three years of the diploma. Knowledge of the terminology and specific details that are presented in the theory class are reinforced when the student applies the knowledge in the practical classes. The four accounting rules and the ‘heart of accounting’ presented in the integration model foster the conceptual knowledge of the science of accounting. The guide or map of the accounting system presents all the interrelationships among the basic elements in an accounting system. This guide, together with the four accounting rules and the heart of accounting, promotes the necessary skills of how to process transactions as well as correct any defects in the students’ understanding of the principles and concepts on which the accounting system is based. I maintain, therefore, that the three levels on the knowledge dimension (Anderson & Krathwohl, 2001) are supported and upheld by the integration model as presented in Chapter 4.

5.4 DESIGN PRINCIPLES FOR THE PLANNED SERIES OF INTERVENTIONS

The planned series of interventions were designed for the staff members of the department to maintain their buy-in to the process of change to align accounting education to accounting practice. This required a change in their epistemologies and pedagogies. The culture and history of the lecturers in the department was based on teaching accounting by means of the ‘chalk and talk’ method from a textbook. Three real fears in the minds of the staff become evident with the implementation of the interventions to integrate the accounting software into their classrooms. The first fear was expressed as that of the unknown, as the staff members were uncomfortable with the idea of dealing with issues that might arise with a classroom of students and computers compared to being in control of the classroom in a way to which they had grown accustomed. One of the final interventions was for the staff to train the selected tutors in the computer laboratories, and although not all issues arose they were more confident in the implementation of ICT in the classroom.

The second fear was that of a lack of support in this new teaching environment. The tutors had been trained and provided to assist the staff in the practical periods on a ratio of approximately 1 to every 25 computers. The ICT staff
members were also trained in the accounting software installation and support role. The third fear identified with the staff was that of making the jump from the acquisition of a skill to teaching it. In the final intervention the staff were not only assessed on the acquisition of the relevant accounting software skills but were also required to provide evidence of the application of the accounting software with the submission of a real-life assignment, similar to that which the students would be required to prepare as a portfolio of evidence. I contend that these design principles presented below were necessary to allay these concerns.

5.4.1 Commit and engage

In my opinion, the design principle for the staff to commit and engage is a key ingredient for the change of epistemologies and pedagogies. The interpretation of the findings supports my opinion and demonstrates that the staff recognised the need to commit and engage in the integration process.

It was evident from the focus groups that the staff recognised the need to be committed to a programme that would provide them with the opportunity to align their skills and knowledge for the integration of ICT into accounting education. The participants appreciated that the staff should be trained first: “You teach the lecturers and the lecturers apply what they have been taught.” They know the accounting software very well: “You need to know the program very very well until you get this ...” This demonstrates the recognition of the necessity to commit and engage with the integration process: “That is the first thing we need to do, is to get the staff up to scratch so that they are in fact Pastel qualified. That can be done now, they must go to Pastel and go through the course and get a certificate and write the exam. Then otherwise you are wasting your time if the lecturer does not know how to use this thing the kids are going to tear them apart.” The participants related their experiences of ineffective and limited exposure to accounting software during their studies, which served to add weight to their claims requirement for the staff to be committed to the process, but more importantly to engage with the accounting software for the effective alignment of the pedagogies in accounting education. They acknowledged that there would be a steep learning curve for the staff for the
effective change in their pedagogy and to apply what they have learnt: “I think it is going to be a learning curve for us as well now changing our whole approach to lecturing.” They understood the need for the PSI to be planned and implemented before the implementation of the integration process commenced for the students. The participants of the focus groups affirmed the need for their pedagogy to be aligned to the accounting software and not for the accounting software to be aligned to the traditional methodology of chalk and talk: “You have to adapt the classroom to what is happening in the program and not then other way around.” This would afford the lecturers the opportunity to adapt the learning material and facilitate the application of their new pedagogy knowledge. They also recognised the need to commit and engage with the new teaching environment of the computer laboratories for their presentation skills to be aligned.

5.4.2 Promote active involvement and collaboration

The promotion of active involvement and collaboration supports the design principle that be a commitment to the process and recognition of the need to engage with the PSI to effectively integrate accounting software into accounting education. The availability of ICT training was supported by 94% of the staff of the department at the buy-in workshop, as they recognised the extensive use of ICT in industry and their need to acquire more skills and knowledge of ICT before the change of their pedagogy could be effected: “Change is definitely necessary. We need to have students who are more industry ready (job prepared). It is no use having all the knowledge and not being able to use it and apply it. Everything nowadays practically works on computers and we must also change and adapt.” They requested alignment of their skills and knowledge to current trends in the accounting environment in practice. It was evident that the staff wanted to learn how to use the technology, to integrate more practical applications into the curriculum, develop the subject content to be in line with technology, and to have the opportunity for active engagement and involvement with the accounting software. A response was clear on the question of what kind of help was needed: “A lot! One: How to use the latest technology in changing our teaching methods. Two: Integrating more
practical (computer based) applications into the curriculum. Three: Hands-on training on whatever package is chosen - accounting...” Also evident for the necessity of active involvement of the staff was that they stressed the need for hands-on training and ongoing support as they should be trained first in order for them to pick up problems and confusion that may develop for students. Many stressed the need for active involvement in workshops and seminars as this would be vital in the changing of their pedagogy. It was stressed that they should also have the training necessary to convert their new ICT skills into pedagogical knowledge and skills.

It was evident from the responses received that collaboration among the staff was important, when it was requested that there be better communication between lecturers on different subjects to promote a more holistic and integrated approach across the finance-related subjects, namely Cost and Financial Management, Taxation and Auditing. They also suggested there be a mentor or expert in the field for one-on-one guidance with the integration process, stating the lecturers need to learn from each other and that there was a need for a community of practice that would facilitate the sharing and collaboration with staff members in these finance-related subjects: “Group workshops are requested to ensure all lecturers have the necessary skill and the ability to apply these skills across different subjects - e.g., a tax lecturer must know that the accounting lecturer deals with VAT on the software program.” This would also promote: “learning from each other.”

These concepts were supported in the responses that the accounting principles would be reinforced with an integrated relationship between Accounting and the finance-related subjects. In support of this need for staff to learn from each other the structure of the PSI was discussed at the management workshop and training of staff in subject groups considered. Although, I confirmed the importance of obtaining their commitment to be actively involved in the training, and acknowledged a need for them to learn from each other in subject groups, it was agreed and it stressed that the PSI should be structured to allow flexibility for staff timetables, and that there should be recognised milestones of achievements in the structure of the PSI.
The staff members were divided into groups of between five and eight, with a Pastel trainer and project leader for each group. They were encouraged to stay with the allocated group in order to promote learning from each and their active involvement with the accounting software.

5.4.3 Direct the tasks to achieve the goals or to solve the problems

The emphasis with this design principle was to support and maintain the focus on the objectives of the PSI. The objective was to integrate accounting practice into accounting education with the outcome being the transformation of epistemologies and pedagogies of the accounting lecturers. The tools to achieve the transformation were the computers, the integration model, the PSI, the accounting software, software manuals and the accounting textbooks. It was important to keep the tasks directed at achieving this goal and stress that the software was merely one of the tools and not the focus in the transformation of the epistemologies and pedagogies.

The integration was intended for all three years of the accounting diploma and this was supported by the staff and the management of the department from the start of the process. To achieve this goal the software chosen accommodated the add-on modules for the integration process to be effective in all three years of the diploma and to facilitate the inclusion of the finance-related subjects in the diploma. There was therefore no distinction made in the PSI between lecturers in the accounting subjects and the finance-related subjects, with all invited to each of the PSI, including the training on accounting software. The PSI was specifically directed to the transformation of the staff epistemologies and pedagogies and followed three cycles: the first for the acquisition of the relevant accounting software skill; the second to provide evidence of the application of the accounting software with the submission of a real-to-life assignment, similar to that which the students would be required to prepare as a portfolio of evidence; the third for the staff to train the selected tutors in the computer laboratories, and although not all issues arose the staff members were more confident in the implementation of ICTs in the classroom.
5.4.4 Provide activities with real-life evidence

Teaching and learning and the integration of Pastel in the interventions were to be kept as real-life as possible. It was recommended that the staff follow a story line and start a business as this was the plan to present to the students in 2011. This would broaden the staff perception from academics to business people and if the staff could be more exposed to real-life accounting and think like business people they would be better lecturers in the integration process.

The importance of this design principle is the alignment of education to real life in order that the needs of the graduates are met when they enter the workplace. The staff recognised the importance of the alignment of their training to be real-life in order for them to be able to adjust their own pedagogies to meet this very important requirement in the integration of accounting software into accounting education. The training on the accounting software was thus in line with practice, with real-life examples and scenarios. The staff members were required to open an imaginary business entity and record a variety of business transactions, including the provision of services, trading and manufacturing transactions.

5.4.5 Respect experience and integrate new knowledge and skill

The ability of the lecturers to present the accounting theory was not questioned and was respected. The Pastel trainers maintained that Pastel Partner, with which some staff members had some experience of working in practice, was different from Pastel Evolution and so it was advisable for all staff members to attend the training session. This proved to be valid as all the staff who accepted the invitation to re-skill went through the training regardless of their experience on Pastel Partner, including the project leaders. All the lecturers in the new environment of computer laboratories needed support and training, and evidence was sought for the integration of their accounting software skill and knowledge in them.
5.4.6 Recognise evidence of integrated learning

It was important to gain evidence of the transformation of the lecturers’ learning and teaching methodologies before the implementation of the integration programme in January 2011. There were three parts, or milestones, in the staff training intervention that they had to successfully complete. The first was the evidence required of the acquisition core module software operating skills. The staff then had to prove their ability to apply their newly-acquired skills by completing a real-life assignment, processing the transactions of a business on the same accounting software. In the third milestone, staff members were required to train the newly-selected tutors, who required the same accounting software skills set in order for them to support the staff in the classroom. The three parts were designed for the staff to develop their skills, integrate their skills with accounting knowledge and then be in a position to convert the combination into pedagogical skills and knowledge.

5.4.7 Provide flexible design

Due to the large number of staff who were keen to undergo the final intervention to acquire the skills of the accounting software, five groups of repeat training sessions were conducted. Such flexibility was necessary due to the variations of lecture times and to fit into the lecturers’ timetables.

5.4.8 Provide a safe and supportive environment

The final three cycles of PSI provided the staff with a safe and supportive environment in which to develop their pedagogical skills and knowledge, as well as to ease their fears and build confidence for the actual implementation of the integration in 2011. It was necessary to provide a safe and supportive learning environment and five project leaders were appointed to oversee and guide approximately five to eight staff members each. The project leaders were chosen not only for their exposure to accounting software but also for their positive attitude towards making the integration possible. There was a Pastel trainer at each of the repeat training sessions as well as in the training of the tutors. The
ICT support staff members were also trained and readily available to assist the lecturers while they were training in the computer laboratories.

5.5 DESIGN PRINCIPLES FOR IMPLEMENTATION

I contend that these implementation design principles are all critical and need to be clarified to the community involved in the implementation process. The community need the assurance that management support all the changes in the teaching and learning environments, which will ensure that the staff members remain motivated and keen to implement the changes. In order to maintain the staff buy-in to the process of aligning education to industry it is significant that they are aware that industry supports the changes and that they will add value to the graduates’ work-readiness.

5.5.1 Recognise need for management support

The evidence of management support for the whole process is crucial and the staff recognised this need. The staff in the focus groups recognised the need for the constant support of management and maintained that for the assurance of management support during the implementation process it would be necessary to keep open all communication channels between management and staff for the prompt, effective and efficient processing of concerns and issues.

5.5.2 Recognise need for industry support

At the management gateway workshop, industry was keen to support the implementation of the integration process and agreed to present at the orientation workshop to demonstrate and reassure the staff of the support of their company. Pastel agreed to supply a trainer for each training session for the staff and tutors, as well as the Pastel Evolution software CD and manual.

At the staff orientation workshop it was evident that staff appreciated the evidence of industry support. It was important to position the department as pioneers in the integration process in higher education, the Pastel Evolution product and Pastel as a company in the environments of accounting education.
and accounting practice. In the introduction it was stressed that the department was the first in South Africa to embark on an integration process of accounting software into accounting education and that we should see ourselves as pioneers, a claim supported and highlighted by the Pastel representatives. The features of Pastel Evolution and the add-on modules were presented to the staff. Their presentation included the position of Pastel Evolution as a product in the market and they also maintained that there was no other university, definitely not in Africa, that was attempting this integration process. They stressed that Pastel Evolution was for a higher level of thinking and specifically suited to higher education arena, as in tertiary education the thinking should be in line with Enterprise Resource Planning (ERP) and the accounting software to match that level was Pastel Evolution.

5.5.3 Recognise need for tools to support integration

All the tools needed to support the implementation of the training intervention needed to be available. Each staff member was provided with a laptop and Pastel CD for the software to be uploaded, thereby ensuring the staff had the facility to practice whenever there was an opportunity either at work or at home. The staff recognised the need for adequate facilities and the appropriate tools to be available for the implementation process to be a success. They acknowledged that the software should not be limiting or inflexible for all three levels of the diploma but should have the capacity to house real-life scenarios for graduates to easily adapt to the workplace. This confirmed that the choice of Pastel Evolution software was a suitable one as it had the facility of the add-on modules to enrich all three years of the diploma. Staff maintained that each student should have access to computer facilities for a better quality education.

5.5.4 Recognise need for careful planning of implementation cycles

It was imperative that the members of the department had the assurance that the management had a very strong and positive approach to the implementation cycles. This was only possible with careful planning of every intervention for the
staff, including the implementation in January 2011 for the first-year students in the diploma of Accounting.

The practical implementation considerations were discussed and the staff informed about the structure of the theory and practical classes; the plan to train the tutors; that the PSI were to be structured; that there would be deadlines and achievement milestones in the training; and that each of the staff members would get a *Pastel* CD and manual for them to practice away from campus. This would provide the staff with a degree of flexibility and allow them to practice on *Pastel*, as necessary for the skills development.

The first cycle of training was for the staff in 2010, and commenced between September 2010 and December 2010. *Pastel* provided the trainers, manuals and CDs for the staff, who needed to sign registers for all sessions as well as the assessments. The final training interventions for those who accepted the invitation to attend the training involved the formation of manageable groups with the appointment of a project leader for each. Each group had a schedule of training that suited their lecturing timetables. The learning material was divided into sections and assessments were designed to match each section. The training and the assessments were completed in November 2010. Each assessment carried a 75% pass mark and was weighted at 50% of the final mark.

The staff members were required to submit an assignment to provide evidence of their application of the skills acquired on the accounting software and this assignment was weighted at 25% of the final mark. It was important for the staff to gain confidence in the computer laboratories and they were thus required to train the selected tutors. The tutors were selected to support the staff in the practical classes and to conduct the tutorial sessions in the computer laboratories. The training of the tutors was weighted at 25% of the final mark. The staff were assessed on the acquisition of the accounting software skill, the application thereof, as well as participation in the training of the tutors. The second cycle of training was for the new staff in 2011 and the tutors for 2012, and the cycle was set to follow the three assessment stages as in 2010. The add-on module training commenced at the beginning of 2012 for the enrichment of the second year modules.
For the continual buy-in of the staff and the management it was imperative that there be evidence of careful planning and due care and diligence in all aspects of the implementation.

5.5.5 Recognise need for all the above support during implementation

It was imperative that in this change process, staff buy-in was consistent and evident. The support of the management was necessary for the process to be implemented and the partnership with industry was a critical aspect in the process of the design of the planned series of interventions (PSI). The social interaction of the staff, management and industry is evident from the first phase to the final phase of the implementation process. The staff raised a concern in the focus groups of the first iterative cycle, that for the idea of the integration to be practical and feasible it would be necessary to have the visible support of management and industry at all times. All these pillars of support needed to be in place simultaneously, and thus it was imperative that management and industry be involved in all the staff interventions.

5.6 CHAPTER SUMMARY

This chapter has provided an overview of the interpretations of the findings from all the cycles. The design principles were presented under the four stages of this study, namely the gap verification and validation design principles, the integration model design principles, the planned series of interventions design principles and the implementation design principles.

The next chapter provides the summary, contributions, limitations and recommendations of this study.
6.1 INTRODUCTION

This research reports on the identified gap between accounting practice and accounting education in higher education for the diploma students and how accounting education can be better aligned to suit the requirements of the workplace. An innovative integration model was engineered to provide a means of integrating accounting software and accounting education. The planned series of interventions (PSI) was designed for the lecturing staff in the department of Commercial Accounting. The process to revolutionise the accounting education arena is argued in Chapter 4 as necessitating the use of the integration model, through which the PSI is implemented. The conceptualisation of design principles was drawn from the iterative cycles of findings and lessons learnt in the implementation of the process. In this chapter, I present an overview of the enquiry and address the contributions of this study. Issues for further consideration and research are put forward.

6.2 OVERVIEW OF THE INQUIRY

In chapter 1, I provided a general orientation to this study, beginning with the need to investigate the use of accounting software in the accounting practice environment. The position of accounting software was then explored in the school and in the higher education environments. The line of reasoning was then proposed that there was an expectation gap between the actual skills and knowledge of accounting graduates and those required by employers. The argument put forward was that a graduate’s education in the accounting would be more adequate if he or she could be employed in an accounting position with the required ICT skills. In order to achieve this I contend that the use and the understanding of the software packages should be integrated into the whole
learning experience, thereby closing the gap between what is being taught and the skills and knowledge expected in accounting practice. The purpose of the research was therefore to construct an educational model that would enable the accounting principles and concepts that govern an accounting system to be integrated with an accounting software package. The transformation of accounting education to integrate with accounting software also required a practical and feasible process that would enable implementation. I proposed that the design of a planned series of interventions incorporating the integration model facilitated this process.

The problem was to close the identified gap in accounting education in order to better equip diploma accounting graduates with the skill and knowledge required in the workplace and attempt to answer the following research questions:

Question 1: How did the design elements of the study serve to verify and validate the identified gap in accounting education?

Question 2: What is the optimum design of the integration model to facilitate the integration of accounting education into accounting software?

Question 3: What is the optimum design of the planned series of interventions to facilitate a practical and feasible process to close the identified gap in accounting education?

Question 4: How effective was the proposed process using the integration model and PSI to address the identified gap?

The focuses of this enquiry was the understanding of my own and my colleagues’ experiences in accounting education and accounting practice and to foster an acceptance and buy-in to the integration model and the process to close the identified gap. The study was therefore qualitative in nature and grounded in the interpretive paradigm to ensure the verification and validation of the design principles of the four stages of the implementation plan.

In Chapter 2, the personal iterative cycles (PICs) and the influences of action research were presented. Action research is discussed separately at the beginning of chapter 2 and it should not be seen as part of a design phase or
cycle. I contend that the enrichment value of the PICs is imperative in the
identification of the gap and understanding the conceptualisation of the
integration model and formed the basis of the early investigation that eventually
grew into design-based research (DBR). I maintain that DBR is appropriate to the
research design. I used action research merely as an avenue to explain the
processes of the conceptualisation of the integration model, identification of the
gap in accounting education and ICT, and recognition of the need to initiate a
process to close the gap and that action research served to explain the formation
of the four stages of the implementation plan of this study. Action research
provided the impetus to develop the four stages of the implementation plan of this
study which were eventually based in DBR. This study reports on the way DBR,
when framed by cultural-historical activity theory (CHAT), facilitated the evolution
of accounting education for the diploma students at UJ. Authorities on the topic
regard DBR as an emerging methodology that supports both qualitative and
quantitative studies in education, and argue that it facilitates active and innovative
research in education. DBR, as characterised in Chapter 2, provided the essential
elements to implement a meaningful process of curriculum transformation to
address the gap between accounting education, accounting practice and
accounting software.

The influence of CHAT as a thinking tool and as a support tool in the analysis of
the data in each of the four cycles of DBR was presented in Chapter 2. There are
two distinct parts to the theoretical framework of cultural-historical theory, the first
of which is the cultural and historical theory, the second the activity theory, and I
contend that both parts were important influences in this enquiry. The recognition
of the cultural-historical background of the staff and management of the
department acted as an impetus to the buy-in and support throughout the
process. The focus of the diploma in accounting has, essentially, been to
empower the accounting graduates with the skills and knowledge for the
workplace. A cultural and historical theoretical lens guided the interpretation of
the data in all the feedback cycles. The activity theory portion was central in the
analysis of the data as it recognised all the interlocking forces of the education
environment in which the diploma in accounting is situated. I argued that the
iterative cycles of DBR and the infusion of the cultural-historical activity theory
framework facilitated the development of the integration process to the extent that the programme was practical and feasible for implementation.

In chapter 3 the research design and methodologies were discussed. The development of the four stages of the implementation plan of this study was enhanced by the PICs of data collection from personal experience in the accounting academic and accounting practice environments. The experience in industry was a key element in the drive for the engineering and conceptualisation of the identification of the gap in accounting education and accounting practice, as well as the structure of the integration model.

The research design was adapted from the basic iterative design of Reeves (2000) of four phases. The design provided a directional map from problem identification to verification and documentation of the interventions and integration model. The main purpose of each of the four cycles was to develop and refine draft design principles for the four stages of the implementation plan of this study, namely, the gap verification and validation, integration model, PSI and the practical implementation process. The four phases of my study were sequential and each was linked together with a cycle of informing the next phase, as well as itself being refined and validated as the study progressed. The objective of the first phase was the analysis of the practical problem of the integration in collaboration with the practitioners, who were my colleagues lecturing in the diploma of Accounting. I termed this phase ‘the substantiation phase’ as the data collected from it was needed to support and validate the gap and the process of integrating ICT into accounting education. The staff of the department were invited to participate in small group discussion in the form of two focus groups discussing the verification of the gap and how best to integrate accounting software into accounting education. Although a large portion of the data collected was verified in the interview conducted with a lecturer in the degree programme, it also served to validate and enrich the data collected on the gap, integration model, PSI and the process of implementation.

The chapter closed with the data analysis section, in which I elaborated on the processes and procedures carried out during the analysis of the transcripts of the feedback forms from each of the four cycles. In the first review the identified
action codes were categorised into the six interrelated dichotomies of Engeström’s activity theory (1999), as this activity system was used as a thinking tool in the analysis of the data. This analysis methodology proved to be a ‘good fit’ as it ensured that the data was reviewed comprehensively from the six perspectives of Engeström’s activity theory (1999). This initial categorisation assisted in the second review of the data as it was then easier to interpret the categorised action codes into the four implementation stages of this study, namely the gap verification and validation; the integration model; the planned series of interventions; and the practical implementation.

The findings from each of the four phases and four cycles were presented under the four implementation stages in Chapter 4. The data collected from phase one and the personal iterative cycles were used in the second developmental phase. The second phase for this enquiry was to design and develop an integration model through which the PSI operated, as well as to consider the practical implementation implications using the convergence of data collected in the first phase along with the PICs. In the third phase a series of staff evaluation workshops were conducted, termed ‘the three authentication and refinement cycles’. The staff indicated that they were supportive of the process to close the identified gap and realised the need to change their pedagogy for the implementation to become a reality. The three staff gateway workshops that followed provided avenues for the restructuring of the curriculum and the buy-in and support of Pastel for the integration process as well as the planning of the staff orientation workshop. The curriculum was aligned to uphold and sustain the integration of ICTs in all the Financial Accounting, Auditing, Taxation and Cost and Financial Management subjects, throughout the three years of the Accounting diploma. Although the curriculum change fell outside of the auspices of this study, the reconstruction was made in consultation with myself and other stakeholders, and the findings of this enquiry assisted in shaping the new curriculum particularly in the three years of financial accounting. Support from Pastel was evident from the first meeting hosted by the management of UJ, and was made evident at the staff orientation workshop.
The staff orientation workshop was successful in sustaining staff buy-in to the process to integrate ICTs into the curriculum, and provided them with the assurance that the support of management and industry would be present for the PSI and the integration implementation for the students throughout the diploma. The Pastel representatives from industry reiterated that UJ was a pioneer in the ICT integration process in the Accounting diploma, and substantiated Pastel Evolution as the most suitable programme for the integration to be effected throughout the three years of the new diploma. A key reason was that in tertiary education the thinking should be aligned to a holistic business view which goes beyond the borders of the defined record and report functions of financial accounting. The thinking should be focused on managing all the resources available to a business entity, or what is also known as Enterprise Resource Planning (ERP).

The integration of accounting software into accounting education was presented to the staff as a process that would involve them further in training interventions for the purpose of closing the gap in the accounting graduates’ skills and what is expected in the accounting practice marketplace. It was explained that the process of the training PSI was for the staff to develop their skills on Pastel Evolution and to work through the integration model for them to better skill the accounting students, thereby producing top graduates. The process to close the identified gap and the integration model were included in Chapter 4 as part of the findings. It was emphasised that the PSI would need to work through the integration model in order to reinforce the rules and for these to become embedded knowledge. With these operational thinking skills firmly in place the students would be able to perform a much higher level of thinking. The operational skills would become second nature and build the confidence for the students to then perform more complex operations in an accounting system. It was evident from the feedback forms received from the staff orientation workshop that the presentation of the process to close the gap and so produce top graduates was supported by the majority of the staff. It was evident that the staff appreciated the underlying design principles of the training PSI that was presented at the staff orientation workshop, as only one member did not see the
need to commit to the training PSI, and this staff member was not an accounting lecturer.

The findings presented in Chapter 4 were further interpreted into design principles for each of the four implementation stages and presented in Chapter 5. One of the design principles for the gap verification and validation is the necessity to recognise that there is a gap in the expectations of the employer compared to the skills and knowledge of the Accounting diploma graduate. The staff members in the department were unanimous in recognising that there was such a gap and that it was important that it be closed. Benefits in closing the gap include cost savings for the employer, with the elimination of the expense of further training or development of a new graduate employee as he or she would have the skills and knowledge required in the workplace. Another design principle would be the recognition of an opportunity to close the gap, and I contend that to ‘seize the opportunity’ could be the impetus for the change process to commence.

The integration model design principles include generic design principles that I believe could be applied to any educational model, which should enrich the knowledge with the integration of skills. The new model should support other relevant ‘tried and tested’ educational tools, such as textbooks. In explaining accounting concepts the ‘T-account’ teaching tool is often used and the integration model incorporates this popular accounting didactic tool. The skills that are to be integrated need to add value to the graduate and therefore need to be relevant, authentic and real-life. I also believe that the educational model should be made user-friendly, appealing and inviting to make the student want to explore what is being represented in the model. It should empower the user to make the connection between the knowledge and skills, and so is designed to be applied in the three years of the diploma in the Financial Accounting subject, thus supporting the notion of ‘use it or lose it’. The educational model needs to support the cognitive as well as the knowledge developmental process. The integration model demonstrates all the above generic design principles and was supported by the staff members of the department of Commercial Accounting at UJ, where the implementation was initiated at the beginning of 2011 for the first-year Accounting diploma students.
Eight design principles were discussed in Chapter 5 for the planned series of interventions and, although not conclusive, I believe these are the more pertinent ones. I identified three concerns or fears in informal discussions with staff members, which necessitated the development of what I termed ‘the three milestones’ for staff to effectively accommodate the eight design principles as well as to allay their concerns and fears. The staff concerns and the three milestones were discussed in the introductory paragraph before I expanded on the design principles for the PSI in Chapter 5.

The fourth and final phase was the implementation phase of the first group of staff of the training PSI. These staff members of the department would then be in a position to implement the integration of ICT into the new Accounting diploma in 2011. There were three milestones in the training PSI for the lecturers, the first of which was the successful passing of the five *Pastel Evolution* core module assessments over a 10 week period. The modules were assessed in the week following the training of that module. The pass mark was and is still currently 75% for each module. It was necessary to hold five repeat training sessions per week to accommodate the individual timetables of the staff. Each training session was hosted by one of the five programme leaders. This fostered a safe and secure learning environment wherein the lecturers engaged with the learning material for approximately two hours a week. It was noted that the groups met and engaged with the learning material outside the formal weekly contact session. This extended exposure with smaller sections of the *Pastel* learning material promoted a deeper engagement, which was a key ingredient for effective integration of the accounting software in the classroom. Another feature of the training was that it was divided into sections that would match the training of the students. The *Pastel* core material was divided into sections that would match the real-life development of a business entity. This was envisaged to commence with a sole proprietor doing business with cash transactions that would then expand into giving credit to customers and receiving credit from suppliers. The business entity was also foreseen to initially commence with the provision of a service and then develop into a trading and manufacturing entity.
The second milestone in the series of training interventions for the staff was for them to complete an assignment to provide evidence of their ability to apply their *Pastel* knowledge and skills. They were required to set up their own pseudo-business within specified parameters, which was also in line with what was envisaged for the new accounting diploma students’ portfolio of evidence. The last milestone was for the staff to train the tutors who would provide support in the practical sessions and conduct the tutorial sessions, also in the computer laboratories for the students in 2011. The three milestones provided evidence of the acquisition of the knowledge and skills of *Pastel* as a tool for the integration of accounting knowledge, the application of the skill and knowledge, and lastly experience in a new teaching environment of the computer laboratories. I believe that the staff needed these interventions to allay fears of a complete change in the teaching and learning environment.

I had hoped that the staff portfolios of evidence could be pooled to form a source of learning material for the implementation of the integration in 2011. Initially, the staff members were asked to develop their own parameters and business transactions for their pseudo-business which could then be used as a basis for the development of learning material for the first year lecturers in Financial Accounting. This did not materialise and in hindsight it was an impractical idea as the staff members were asked to complete these interventions in addition to all their other normal duties and pressures at an inconvenient and busy time in any academic’s life at the end of a semester. Staff members were invited to commit to the three milestones and of the 38 academic staff members in the department 37 signed on for the training interventions. Four withdrew in the first week, citing reasons as being that three were going on pension and did not feel the training would be relevant, and one felt incompetent, was not an accounting lecturer and had not engaged with accounting since the times as a student. Of the 33 remaining, 26 (79%) successfully completed all three phases. 64 tutors completed the five modules and an assignment and were found to be competent to support the lecturers in the integration process in January 2011.

I contend that the implementation process will need to be supported by the staff; the management of the department and the faculty, and the accounting industry
in the workplace. The final design principles for the implementation phase were presented in Chapter 5, after the design principles of the gap verification and validation design principles, the integration model design principles and the planned series of interventions design principles.

The next section summarises the methodological, theoretical and practical contributions of this inquiry.

6.3 CONTRIBUTIONS OF THE INQUIRY

The methodological contribution of this inquiry can be found in the way DBR and CHAT facilitated the design of this study, as well as contributing to finding solutions to the questions of what, why and how the identified gap in accounting education can be closed in order to better equip the Accounting diploma graduates with the skills and knowledge required in the workplace. The inquiry demonstrated in Chapter 4 how the process facilitated by the iterative cycles of DBR and CHAT may facilitate curriculum change with a focus on the incorporation of technology in the higher education arena. DBR was a fundamental ingredient in the design of this study. The process of aligning accounting education with accounting practice through the integration of accounting software was validated and supported by DBR, whilst CHAT was infused into the iterative cycles of DBR. Both parts of CHAT were important influences in this study. The feedback forms were analysed through the cultural-historical theoretical lens and the activity theory acted as a thinking tool in the analysis of the data collected in the focus groups, interview and all the feedback forms generated in the iterative cycles of DBR. It was significant that recognition was given to the staff in department of Commercial Accounting’s cultural and historical backgrounds when engaging with a process of integrating accounting software into accounting education. The focus of the diploma in accounting has, essentially, been to empower the accounting graduates with the skills and knowledge for the workplace and with the integration of ICT this career-focused feature has been supported and upheld. The activity theory was a thinking and support tool in the analysis of the data in each of the four phases of this study’s
DBR. I also found that the pioneering of the use of these research strategies in accounting education is a notable methodological contribution.

The theoretical contributions of this inquiry are the design principles presented in Chapter 5, derived from the interpretation of the findings and validated through their use in the implementation process of the planned series of interventions and the integration model. The design principles derived from this inquiry relate to the gap identification, the integration model, the planned series of interventions and the process of implementation. These could be of relevance and contribute to the research body, in which there is a recognised gap, and the design and implementation of an educational model is identified as a possible solution.

The research resulted in three practical contributions and artefacts which were proposed and implemented to effect the integration of accounting education and accounting practice. The first was the design of the planned series of interventions engineered for the lecturing staff in the department. The second innovation was an integration model, which is a combination of accounting tools and essential rules and principles represented in any accounting topic, with those same rules and principles which govern any accounting software. The third was the process of four steps to effect change in the educational environment to better align the knowledge and skills of the accounting graduates to the requirements of the workplace.

6.4 LIMITATIONS OF THE INQUIRY

The outcomes of this inquiry provide strong support for the need to integrate accounting software into accounting education. However, the design of the planned series of interventions and the process of closing the identified gap was engineered for the staff lecturing to the diploma students. Findings therefore cannot be generalised to the lecturing staff in the degree programmes as the Accounting degree programmes do not have the same career-focused alignment as the diploma programmes and the integration model would not have the same practical three-year application benefit. In addition, lecturers from only one university offering diploma programmes were involved in this inquiry and the
findings, although there might be similarities, cannot all be generalised to other diploma lecturers in tertiary institutions.

6.5 ISSUES FOR FURTHER CONSIDERATION AND RESEARCH

The integration has already developed interest in further research, particularly in the training of the tutors in their supportive role to the lecturing staff. A significant area for further research is the development of integration pedagogy knowledge and this area could be researched from the experiences of lecturing staff involved in the first year of implementation. A related issue would be the research into the engineering of interventions which would assist the lecturers in constructing authentic learning material to ensure effective integration of ICT into accounting education. Another area that would benefit further research consideration is how to improve classroom and computer laboratory practices to support and uphold the integration of ICT into accounting education. How better to integrate the finance related subjects with accounting software for a more holistic work readiness experience is a research issue that would benefit the integration process for the staff and the graduates. Interaction design should be considered after the implementation phase to increase the effectiveness of this artefact in the integration of ICT and accounting education. The question of integrating ICT in the degree programmes could be considered for further research.

Issues for further consideration on the longer term for the accounting diploma graduates could be:

- Are the graduates better equipped for the workplace with the integration of ICT skills with their accounting knowledge?
- Are UJ Accounting diploma graduates favoured in the workplace over other tertiary institution graduates?
- Are the graduates able to transfer their ICTs skills from Pastel Evolution to other accounting software packages?

These recommendations for further research are incomplete and further examination and analysis should lead to the identification of other possible areas for research.
6.6 CONCLUDING COMMENTS

The purpose of this study was to find a practical and feasible solution for the identified gap in accounting education, and for it to be closed so as to better equip Accounting diploma graduates with the skills and knowledge required in the workplace. The implementation of the findings upholds the need of a process of integration of ICT into accounting education. Although the curriculum change, in 2012, is in the second year of implementation, there are clear indications that there will be a desirable outcome. The opportunity remains to further develop and research methods to improve this new and unexplored challenge and so sustain the integration process.


Kitzinger, J. (1994). The methodology of focus groups: the importance of interaction between research participants. Sociology of Health & Illness Vol. 16 No. 1, 103-121.


APPENDIX A: CONSENT FORM FOR FOCUS GROUP

CONSENT FORM FOR PARTICIPANTS PARTAKING IN RESEARCH ON THE INTEGRATION OF ACCOUNTING EDUCATION AND ICT TO CLOSE THE GAP BETWEEN THEORIES AND PRACTICE IN ACCOUNTING IN HIGHER EDUCATION

THE LECTURER

I am a Doctoral Student in the Department of Mathematics, Science, Technology & Computer Education (Faculty of Education) and a staff member of the department of Commercial Accounting at the University of Johannesburg. I am conducting a research study on the integration of accounting education and ICT and to develop and design a planned series of interventions (PSI).

I would like to invite you, with your consent, to form part of this study. Your participation will be in the form of a focus group interview and then participation in a workshop to evaluate the PSI. The successful design of the integration programme will not be possible without your collaboration and shared learning experiences. With your consent, the focus group interview will be recorded. This tape-recorded interview will be analyzed and stored in a secure environment. Please note that even if you do agree to be part of this study you are at liberty to withdraw from the study at any time, without any pressure to provide reasons. I undertake to ensure that you as participants are not caused any harm by partaking in this study. In addition, it is my belief that there are a number of possible benefits for you as participant in this study. Being part of this study you will be privy to the outcomes of the research. I hereby request you sign the attached document, in order to indicate that you are familiar with the conditions stated above, and that you have consequently given your permission to take part in this inquiry, and to be interviewed by me. This letter must be signed and dated by you the participant as it forms part of the requirements for ethical research as mandated by the Ethics Committee of the Faculty of Education.

Thank you for your support and assistance in this study.

Nadia Rhodes (Researcher) Geoff Lautenbach (Supervisor)
082 546 8510
CONSENT FORM FOR PARTICIPANTS PARTAKING IN RESEARCH ON THE INTEGRATION OF ACCOUNTING EDUCATION AND ICT TO CLOSE THE GAP BETWEEN THEORIES AND PRACTICE IN ACCOUNTING IN HIGHER EDUCATION

I, the undersigned, (Prof/Dr/Mr/Mrs/Ms) …………………………………………………., hereby indicate that I have read and understand the conditions for participation in the above-mentioned research as contained in this letter. I hereby give my written consent that I may participate in a focus group interview by Nadia Rhodes, noting the conditions below that:

- The focus group interview will be recorded on an audio recording device and that the researcher undertakes to store the recordings of the interview in a locked environment.
- Permission granted to record the focus group interview………………….Y / N
- Participants will be afforded the opportunity to comment on the findings from the interview by means of seminars and a workshop
- Participants will at all times be fully informed about the research process and purpose.
- Consent to participate in the research will be obtained on this letter signed by the participant.
- Participants will be at liberty to withdraw from the study at any time, without any pressure to provide reasons (voluntary participation).
- All possible means will be undertaken to ensure that participants are not caused any detriment by partaking in this study.
- Participants will not be exposed to any acts of deception or betrayal in the research process or its published outcomes.
- Faithfulness, keeping of agreements and loyalty in interpersonal relationships are central to the reputation of the researcher and individual participants.

____________________________     _______________________
Signature of participant                Date

____________________________     _______________________
Signature of researcher                Date

____________________________     _______________________
Signature of Supervisor               Date

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Appendix B: Consent Form for Interview

CONSENT FORM FOR PARTICIPANTS PARTAKING IN RESEARCH ON THE INTEGRATION OF ACCOUNTING EDUCATION AND ICT TO CLOSE THE GAP BETWEEN THEORIES AND PRACTICE IN ACCOUNTING IN HIGHER EDUCATION

THE LECTURER

I am a Doctoral Student in the Department of Mathematics, Science, Technology & Computer Education (Faculty of Education) and a staff member of the department of Commercial Accounting at the University of Johannesburg. I am conducting a research study on the integration of accounting education and ICT and to develop and design a planned series of interventions (PSI).

I would like to invite you, with your consent, to form part of this study. Your participation will be in the form of an interview. The successful design of the integration programme will not be possible without your collaboration and shared learning experiences. With your consent, the interview will be recorded. This tape-recorded interview will be analyzed and stored in a secure environment. Please note that even if you do agree to be part of this study you are at liberty to withdraw from the study at any time, without any pressure to provide reasons. I undertake to ensure that you as participants are not caused any harm by partaking in this study. In addition, it is my belief that there are a number of possible benefits for you as participant in this study. Being part of this study you will be privy to the outcomes of the research. I hereby request you sign the attached document, in order to indicate that you are familiar with the conditions stated above, and that you have consequently given your permission to take part in this inquiry, and to be interviewed by me. This letter must be signed and dated by you the participant as it forms part of the requirements for ethical research as mandated by the Ethics Committee of the Faculty of Education.

Thank you for your support and assistance in this study.

Nadia Rhodes (Researcher)                               Geoff Lautenbach (Supervisor)
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I, the undersigned, (Prof/Dr/Mr/Mrs/Ms) …………………………………………………... hereby indicate that I have read and understand the conditions for participation in the above-mentioned research as contained in this letter. I hereby give my written consent that I may be interviewed by Nadia Rhodes, noting the conditions below that:

- The interview will be recorded on an audio recording device and that the researcher undertakes to store the recordings of the interview in a locked environment.
- Permission to record the interview…………………………………………….Y / N
- Participants will be afforded the opportunity to comment on the findings from the interview.
- Participants will at all times be fully informed about the research process and purpose.
- Consent to participate in the research will be obtained on this letter signed by the participant.
- Participants will be at liberty to withdraw from the study at any time, without any pressure to provide reasons (voluntary participation).
- All possible means will be undertaken to ensure that participants are not caused any detriment by partaking in this study and a pseudonym will be allocated to all participants to protect identities and to guarantee that any information revealed, either personal or professional, will be regarded as absolutely confidential.
- Participants will not be exposed to any acts of deception or betrayal in the research process or its published outcomes.
- Faithfulness, keeping of agreements and loyalty in interpersonal relationships are central to the reputation of the researcher and individual participants.

____________________________                         __________________________
Signature of participant                             Date

____________________________                         __________________________
Signature of researcher                             Date

____________________________                         __________________________
Signature of Supervisor                         Date
Appendix C: Focus Group Transcript: Adel, Alvin, Amy and Andria

1. Moderator- Thank you very much for coming and giving me your time. The idea of this focus group is to see how best we can integrate, practice and technology into our classes. Ok, Amy you were interested in seeing four hours of contact time,

2. Amy- yes four hours a week and we usually try to cover a topic but I think we need at least three of the four hours for theory. Practice in one hour,

3. Moderator- Do you think it’s enough? Do you think the lecturers need training?

4. Adel – That’s why you need a smaller group because I can guarantee you when you give them an instruction half will get it right and the other half will need individual attention. Problem with pastel and the people that work with pastel is that they have no theory behind them so if they don’t know they just enter anything. It balances anyway and then they get to the end it’s a big tax up anyway. Lot of people that uses Pastel just debit and credit, don’t realise it’s a cash book.

5. Basically I think we could scrap the third year and only take them up to accounts 2 and then you have a student that can goes out and do the job because they have done it manually and on the computer. We should spread it over two instead of cramming a whole lot of info they are not going to use.

6. Andria-Then we can better equip them for the job that they are going to do.


8. Adel – yes basically the whole of the third year syllabus they will not really use it in practice – small chance – very small chance. The ones that need it can convert to a degree if that’s where they want to be. But if we do accounts 1 and 2 over three years properly they will be far better equipped to handle accounts 3 when they get there. I think we should go to industry and say this is what we are doing and what do you think we should be doing and they will say to us that a diploma student- we are not going to use them at a high level. They can tell us if they need accounts 3 or costing two.

9. Moderator - Do you think there is a possibility of bringing in other integrations of subjects into this data – into this exposure?

10. Adel – In tax you can do the same thing. They are not going to be giving tax advice. They are going to do tax returns so we can show them what tax is about, this is a basic tax return, them how to register, how to be a practitioner. We must maybe speak to SARS and go in as a user knowing that it is for education purposes.

11. Moderator – Like an educational programme

12. Adel – ja, like an area of their main thing where you can go back and allow the students to have access to that and then they can wipe it clean at the end of the year.

13. Andria – Even in costing 1 you do the payroll and the whole topic on wage calculations and the stock sheets they can do on excel.

14. Moderator – the accounting software can handle stock sheets automatically- and it even has point of sale, where you make a sale and the stock sheet is updated automatically-that’s the perpetual inventory system. Perpetual and periodic the system can handle both,

15. Adel – But you’ve got to still teach periodic
Moderator - Do you think we should include the non-accountants students like accounting techniques and accounting skills, do you think they will also benefit? Will they have a better viewpoint if they did everything?

Alvin - I think so. Moderator they do need the basic skills.

Adel - ...like purchases and sales because then they have done pastel and they have done it manually. We don’t need them to understand and fix errors. They just need to know where the debits and credits come from and how the transactions are recorded and what do we get out of it.

Moderator - I’d like to raise another issue here, is it more integration rather this is accounting and this is the software. I’d rather like to see them coming together because the way we teach the T accounts isn’t like that on the system, so we don’t even teach like that we go straight onto the system. We teach them the basic principles of accounting perhaps but we need to link it all the time to the system. They must learn to read a ledger account in narrative format, not T account format, so not six months of theory and then six months of practical. I’d actually like to see the whole revamp of the way we present the theory. Do you think that’s feasible?

Adel – With the T account system but there’s another problem. Let me give you an example from the schools situation. In std nine or grade eleven I think they do departmental accounts this is the only place in the whole syllabus in school where they see periodic stock everything else is perpetual inventory. When you come to show them periodic stock, they tell you immediately that only applies to departments; you can only do periodic stock in departments. Why is that the only place they saw it in school? So if you teach them that a ledger account must be debit or credit balance and they see a T account they’ll be lost.

Moderator - …Where do we use T accounts?

Adel - they use T accounts to correct errors.

Andria – so it’s still the best way to explain stuff.

Adel – absolutely, yes.

Andria – we must show them how to correct items just too quickly make two little T’s.

Adel – it’s very difficult to see it in a narrative form.

Moderator - so you’re saying that the T account is basically a training tool to help them understand the basic concepts.

Adel – and when in doubt go back to the T accounts.

Amy – So you would showing us in the lecture room to show them on the board, by drawing on the board and then showing them how the system works.

Alvin- They must know what they do in industry so when they move from here they must know exactly what to do.

Moderator- they must be able to sit and do the job.

Adel – there are still manual systems out there.

Moderator – where? No even the bowling club is manual. The idea is that we can find a replacement teaching tool. We haven’t explored the area. But for example the IT guys don’t work with debits and credits they rather work with plusses and minuses. They say what do you want an account when you buy a new car, what happens to the account? Must it be a plus or must it be a minus? Why use T accounts because now we have to find something else that we use to teach?
Andria- ok, just an example, let’s say you purchase a vehicle how do you explain that? I just always go back to the T accounts. I can’t see how we can change. They don’t physically do the ledger account. They do the input and the system posts it. They don’t do the posting.

Moderator- they have to read it, they must read it and understand it

Andria- it’s easy to read –I can’t see the problem with teaching T accounts

Adel- yes absolutely

Adel- I recommend T accounts

Moderator- I still want to argue the fact that this tool can be replaced perhaps we must revamp, not necessarily reinvent, if we find that that is the right tool

Andria- haven’t you found that when a student comes to you for help and you start explaining you realise that this guy doesn’t understand basic principles so you can’t do away with it.

Moderator- I’m not saying replace that, I’m saying replacing the tool of the T account, and maybe relook at things and try and teach on software on the system what is there and understanding from the system but so that there is not a distinction that this is software and this is theory because it’s one in the same. I’m just raising the question here.

Adel- I just find that it’s useful to use the T accounts for the plusses and minuses to be on the right side.

Alvin- ...so what I did this year most of them have never seen the T account and the ledger was at the back and I had to start with the accounting equation so what I did was rather than use the T accounts I used the plusses and minuses. Because I can tell you what was happening my T accounts was in chapter 4 and I started with chapter 1

Amy – how did you explain the debits and credits?

Alvin- so I got a the accounting equation and now we have a vehicle and the assets are increasing and the bank is decreasing

Moderator- yes – plusses are debit but certain plusses can also be credits it is possible to teach Alvin’s way, because they didn’t want to know what a ledger account is they don’t know what T account. This as an asset if you want to increase it you debit but now that you’ve classified this as a liability if you want to increase it you actually credit it. There is no T account.

Amy- it’s very easy to lecture with the T, it’s just you must still, you’re talking about this plus thing and this minus thing they must know –on which side it goes that is something they must learn

Adel- pastel does it for you

Moderator- but, they have to set that up for themselves

Adel- but it’s already set up for them

Adel- you also have to show them how to, they need to create an account themselves and where it’s going to be on the balance sheet or the income statement.

Amy- I think it’s going to be a learning curve for us as well now changing our whole approach to lecturing

Moderator- how do you see possible roll out that we teach the lecturers for a year and then we go to the students and we give ourselves a year to change the way we teach or do you think we should jump into it

Alvin- I think we jump. We’re already behind
Adel- I think we need to know where we are going to start

Adel- are we going to start by saying okay we need to revamp the syllabus or we going to start by first going the electronic route and deal with the syllabus later and maybe cutting out certain things, if we going to say we are going electronically first of all we need to just jump in and get going but if you going to first change the syllabus and then roll it out automatically and the lecturers would be able to work though it

Moderator- do you think it’s feasible if we take next year and in the background we actually look at accounts one and we say, we either have a parallel group?

Amy- We should use the rest of the year to figure out a way and exactly what we need and then start with it next year and get everything ready to know if you need approval for all these things you can’t just decide you’re changing this and this – to start it fresh next year with our new students as our testing group. As with this group we have already done six months. I would not start with it now. There’s still a lot to learn and now in the next six months we have to go through it with them and we have to do that now, we can’t change the syllabus now

Moderator- no, it would be the new intake

Amy- there’s still a lot of work; we still have six months to get everything ready and sorted out as to exactly what we have to do next year

Moderator- redesigning okay then teaching the lecturers over the next year

Andria- oh yes, you can teach, you can teaching us

Moderator- or do you think that it’s just too long and maybe teach hand in hand you teach the lecturers in January and they start they start lecturing in February the first month and then you teach while they’re teaching you go on to the next and you teach the lecturers in February Marches stuff, do you think that would work?

Alvin- we can’t because, if you delay teaching the lecturers this year then everything changes and by the time we start next year and we’d have to retrain them again, it would have to be done as a process. You teach the lecturers and the lecturers apply what they have been taught.

Moderator- so then we will actually be ahead of the students by say one month

Adel- Why don’t we run the whole thing as a pilot for one year and you take one lecturer and you take two groups of first year students, first year students that have had accounting at school and first year students that have not had accounting in school we split those groups into two groups as well equal sized groups and for each of the groups one you use the method that you’re using now and the other group you use half of them the method you using now and the other half the new system where you are going to bring the two together and see what the results are at the end of the year as opposed to the two separate groups, there are four groups but two separate screens, those who have had accounting we will teach the normal way and those who haven’t had accounting and those that haven’t. Those that have had we will teach the integrated way and the other guys will do exactly the same thing and to see what results will come out of there at the end of that just as a pilot to see if this is in fact the way to go

Moderator- in response to that I think we’ve ran out of time

Andria- I don’t think we have a choice we know we are going to do this so why delay, because the students want to do it now, they want to

Moderator- train the staff and then you lecture a month or three months

Amy- or at least a whole semester, or at least up to the holidays
Moderator- yes

Amy- so that they’d know exactly what to do up to there

Moderator- but then we might need to meet like in December or what we can do is we can bring in intense training, three months training in January because we know accounting and then, so we take a month to train the lecturers and then you can take the three months and then we take April

Adel- but when are you going to train the lecturers

Moderator- but now, first of all, how to teach on the system, because now they not going to…I don’t know how many of us have actually …

Adel- well that’s the first thing we need to do, is to get the staff up to scratch so that they are in fact Pastel qualified

Moderator- exactly

Adel- that can be done now, they must actually go to pastel and go through the course and get a certificate and write the exam

Andria- how long does it take?

Adel- I don’t know how long it takes but the exam is about three hours –then otherwise you’re wasting your time if the lecturer doesn’t know how to use this thing the kids are going to tear them apart

Moderator- exactly

Andria- then you can just focus in January on training…

Moderator- …on teaching the lecturers to teach now on the system —

Amy- because then we know now how to use the programme

Moderator- would you think that another software, a software that is much more uh, has got a lot more features and could possibly use the second and third year could be better than Pastel.

Adel- ja

Moderator- it’s the same, so why not teach the lecturers on a better system where we can integrate much more tax, much more costing because there’s like a costing ledger, you know you don’t have to teach integrated uh non-integrated and integrated costing systems when it’s there in accpac and then you’ve got – decision making, whatever situation is in there – not just stick to what we’ve always done Pastel because pastel has got its limitations

Alvin- ja, I was also thinking actually about a system that would consider all the packages that are available and cover everything so that when the student goes to a company where their using accpac

Moderator- yes it’s much easier to convert from a higher level package to a lower level than from a lower level to a higher level

Alvin – and then we get ahead of the BCom students then we will know more than them

Moderator- exactly

Alvin- I’m just saying that we should cover this niche…

Moderator- yes
Alvin- the industry is now going to demand more students from us than...

Moderator- than than...them thank you, it should be like that because we are teaching the lower management level not the top...

Alvin- there was a time - looking at the situation in the UK already where diploma students I don’t know X number usually covering one CA or something like that

Moderator- yes, absolutely

Alvin- so that would help quite a lot

Moderator- no, thank you very very much, is there anything else

Alvin- I’m wondering, the FIS students what are they supposed to be doing at this school, I mean – computer technicians with accounting backgrounds

Moderator- they, yes, but they don’t know the link between accounting and software, they do the three…like you can ask a student in costing to do a journal and he will not know what a journal is in costing because he is now in the costing frame of mind so you’ve got the IT student that does IT and he can handle it but when he comes to accounting and he has to maybe interlink the programme into a business software or something he can forget it because now they in boxes that’s why I think that the more subjects we interlink the better , because you can ask a second year costing lecturers how come the students don’t know anything about accounting –laughter- you know, didn’t you teach them debits and credits because they go into subjects as boxes, this has got nothing to do with accounting and this is what I’m hoping to overcome here, that they can handle much, to think like an accountant and not just think Pastel or manual system or T accounting – laughter
APPENDIX D: FOCUS GROUP TRANSCRIPT:
BONITA, BELLA AND BETTY

Thank you very much for coming. The focus this morning is going to be on interlinking and bringing together Accounting Technology and the way we teach accounting. Bella can I ask you specifically to please tell us your story about converting degree with your husband’s books what happened.

Bella- Okay Moderator, they asked me end of last year if I’d be able to help them with their accounting and stuff and I said yes because it can’t be that difficult, and they actually wanted my husband to do that so I said yes I will do it in my private time and after hours I’ll help out and whatever and they bought a quick books programme that I’ve never seen before and they gave me the whole cd and stuff and said that I need to start now, and then first of all I think - and then he came back to me and he said to me okay, here’s your programme and – and he said to me well you’re the one with the degree um and he studied IT or whatever – so I asked him, and he said to me um how can you not know this – sales and everything and I said to him well I studied BCom. Accounting and he asked me what I’m doing now and I said well I’m lecturing in accounting, he said well how can you lecture accounting when you can’t even do a normal sales – on a program – but that was just basics so I laughed and I was embarrassed because I’m lecturing accounting and I told him at UJ and I was like – You phone a help line and the guy will take you through the whole thing, so ja, it was shocking actually. My husband studied – he knows more about the programme than I do because he just read through the books because he had the time to do that and I –

Moderator- so you actually did pastel, or just excel and word

Bella- excel and word we had like a – it was only a six months course

Moderator- how did you find that?

Betty- Um you have these um this specific task of deadlines – what I found is that you just get to the end – just get it done – in the classroom teaching and stuff …just do it…--

Moderator- so it wasn’t at all integrated or interlinked with your studies with your like accounts one so you don’t go to class learning about setting up an account and then you go and set it up on a computer

Bella- ja…

Betty- we can’t even remember what we did, we might have done the stuff but I can’t remember

Moderator- ja ja ja ja that’s the problem that we had here as well, people just don’t link the two that’s actually a separate subject working the computers, it’s not the same subject as in the accounting classroom –

Betty- for the first time – vat and purchases and sales and it was the first month end and I got to the bank statement that was the first time that I realised that everything actually happens in one month, doing a chapter you have to combine the whole account. And do you do your things on the perpetual or on the periodical system? –laughter-

Moderator- I don’t know

Bonita- we are using the periodical system at the moment, but the problem is now that, we have problems.
Bella- the IT guy told me that – theory – every time you have this comment that’s what you do in theory let me show you how you can do this no because I mean we actually just did the obvious where you have sales office and we don’t really put in our discount and this and this and this we actually make it too straight forward, it’s not like the basics every day, it’s like I don’t know real life –

Moderator- but isn’t that probably what our students are experiencing, when they go out to work …and you also had a story –laughter-

Bonita- they asked for the last audit that I did I specifically did a trust audit – ok I’ll help out with their book, and I thought I had all this knowledge I mean I was going to do this audit no problem but of course you need a proper accounting package they just trusted me I mean – so I got pastel because I thought I knew pastel but just from going to clients and seeing what they did so I thought – I started making backups every day and you learn from that – definitely big lack from real life and what we do here, and what I also – it’s not like you can ask somebody should I pass this transaction in this way you must do it you must actually know what you’re doing –

Moderator- do you think that there’s a possibility of actually much more closer relationship between the classroom and accounting subjects, how do you see it, do you see perhaps two hours of theory and two hours of practice do you see the students sitting there behind a computer and you teaching posting actually takes from subsidiary to general ledger okay and if it’s a debit in the cashbook and it’s a credit there, some basic theory and then you say okay, the system will do that for you and you press the update button and this is the result do you see that happening? How do you see that integration, let’s start with Betty, how did you see it? –

Betty- ja I think it is a very good idea definitely – but um the question was raised that you brought up in the meeting about uh, I understand what you’re saying about the T accounting is not in the um in the software but you know now that the program will do it for you but don’t you need to know the theory behind it to be able to understand the program as well, that’s my own question so if you limit the theory I’m just scared that they’re going to not um focus on the theory and just think okay the program is doing it for me anyway so I don’t have to actually worry

Moderator- I also think that we have to run assessments parallel to so there will be maybe a theory exam and assignments from pastel to back up, they must prove their own work and so on, their own thinking and understanding of accounting. I think the emphasis might be different.

Betty- ja I know, the time constraints for the – can’t we make it three hours theory and two hours practical, and maybe a five hour accounting week –

Bella- What I also now find challenging is now for the first time I’m I mean - the actual document because I think that’s the first place you should start – that’s also not real life – I think we must go the closest to real life, so I would say give the student the necessary documents, and they must actually capture it themselves on the system – make that a part – intimidating – now I get all these orders and stuff and now I need to understand what’s going where and where to allocate things. Give them a bank statement and they need to go and see what guy paid and… - and from there maybe, from their documents maybe the second half – and then after a week you actually set up what you’ve done from there, so they – each other and then do the VAT physically then afterwards – teach them all, everything relating to – the end of the year, like accounting all the theory all that – because they first need to study

Betty- and then the documents and the transactions

Moderator- absolutely

Betty- I think we will have to start with maybe –

Moderator- don’t you think that they’ve already – don’t you think it would be better if you do it hand in hand. Don’t you think that they would forget, that their already separating now. Okay, this is basic basic, I was thinking I don’t know if you like the idea or…basic debits and credits and the whole accounting process, two hours now you have to set up assets
liabilities all that – and basically what the purpose of - and then instead of T accounts increase and then buy more assets – 
sell and expenses – think of ways where we actually teaching on the system

Bella- but can’t you once again still – but maybe teach them all the theory and a computer session where you give them a 
question –

Moderator- I was thinking of a database okay but they build up their data base themselves they actually open up – they 
have a bank account and they live with that and when you change to a partnership they convert their own little business 
into a partnership they have their own name, they set up their own name they work out their own prices and then the 
Costing people can say well how do you cost a product and material labor overheads and then they come in your stock 
sheets it’s all on the system and then they can work out stock sheets and then we can decide are we only going to go for 
perpetual or are we going to teach periodic and then you can differentiate the two because most... you can actually decide 
how you want to run your system if you’re going to go for perpetual or periodic and then when you get to second year and 
you want to start a company, convert your partnership into a company or if you want to start a club in conjunction with 
your…and teach clubs this is all on the system and they actually get to do their members and subscriptions and all that

Betty- Edulink …

Moderator- ja

Betty- on a network where they can…

Moderator- I don’t actually want to work through Edulink

Betty- oh okay

Moderator- I actually want there to be a … because we had the, mainframe can handle it where a student has his own 
account on the mainframe.

Bella- the idea of even setting up the whole programme because when I just think about my husband’s experience – with 
no accounting experience and I ask him I want to do this and then he actually showed me how to do it and I was like, how 
do you know this, and that’s – setting up the whole programme and stuff is –

Betty- - - the costing also

Bella- and then you –and assemble them and give them a cost and an overview –as well to set up the program so that 
was ja, challenging …

Bella- so I think costing – ready a company

Moderator- but you see now if we teach the theory immediately like the next day they go home and they can access their – 
tasks

Bella- like give them small homework where you just teach theory in the class and they must take that theory and they 
must go and apply it, and then at the end of a lesson you do your company on the net or whatever and then – and then 
that afternoon they – you’ll have to show them otherwise they will also be lost

Moderator- - absolutely how are you going to –no it has to be done. What do you think about timeline, how urgent do you 
see this idea to be?

SYMULTANIOUS- very urgent

Moderator- what do you think if we get the lecturers into the accounting software in the next six months training and then 
already see how we can change and start with our first years
Betty- I would say that the lecturers would have to be on the programme for about six months or so, and only now I can see that, how constructive a textbook – because you need to know, you need to get to know the program very very well until you can get this into the classroom because you have to adapt the classroom to what’s happening in the program and not the other way around because you can’t integrate the program into what’s happening in the class.

Bonita- you can’t take your textbook and go and learn chapter one and then go and teach it to your students you already have to know the whole textbook so that when you start with chapter one you can teach chapter one –

Moderator- I’d like to think that we are able because of our accounting knowledge to convert that quicker that six months. We might take a year to do what we’ve learnt in six months, this is the first year lecturers, but then the second year lecturers have to know what the first years have done and then be able to work with that. Ja, because we know accounting from start to finish – but I think your point there, that you have to be there right at the start on how you set your parameters up on the system, you know how you define that, how the system has to calculate that are you exempt or not and so on

Bella- because the systems aren’t friendly towards that, you can’t go halfway and change it – they don’t accommodate changes and corrections …

Moderator- no no no, but a big thing will be also instead of emphasising how to set up a trial VAT system, the big thing will be how to correct incorrect information –

Betty- but which um…would you then choose to use –

Moderator - definitely the choice would be between Pastel and accpac. Accpac has got…it’s a much higher level and even has what if scenario modules and definitely a huge manufacturing module and most…you see they have a large companies and the small companies use pastel and I think if you know Accpac …

Betty- that’s the only thing – teach them on this program and when they get their own company one day and then –

Moderator- the system processing information is the same so when you say update or you don’t say post, it’s either update or…other technical terms. It automatically does something that we expect it to do when it posts –

Bella- I think there are similarities between the two; there are differences, but also similarities

Moderator- very much, very much – I’m hoping to get us going onto that

Betty- and then the resources from the department’s side, will they release funds for the project

Moderator- well if I can say how embarrassing it was yesterday, one of the facilitators of the workshops said um, we cannot possibly have an industry ahead of the university

I don’t think it’s a question of how, they must really just make a plan and I think if we go to industry and see to process that information immediately they can

Bella - if we have provision to actually try and teach in school or teach a program

Moderator- I think what my need is to get us to be the leaders and then whoever goes out, it’s fine because then UJ lead pioneered this whole thing. And what I would like to see is you know, you go out to Cape Town, you go to Durban and it’s just UJ and its just magic and I also think what would be my dream is to have an accounting clinic and our third year students actually pick up practical experience and use our students and we have like a whole – help keep our software and our systems up to date it can be UJ based it can be run by UJ – and then I actually see the auditors disappearing, and you can do our audits – you can do your first year articles during your third year – get paid, build up some experience

Betty- how big are the computer labs?
Bella: con Cowan, con Cowan…

Moderator: their overloaded, – we have to make a plan

Bella: each classroom must be computer equipped, because no company will have a person sit at a desk without having a computer -

Moderator: – Is there anything else? Thank you very much for your time.
Appendix E: Interview Transcript:

Interview with Cherie

Moderator- Firstly, the outline of the structure and how it fits into the course

Cherie- ok um, we've got a subject called Business Information Systems and its two A and two B. Two A is a first semester, we do Microsoft office and Windows operating system or whichever one the University is on so we still on Windows that's what we doing. First semester is only for BCom. Accounting students, I think it's BCom. Financial management and there's another one called Investment Management those who are allowed to do BIS 2A in the first semester. That gets taught to say the other twelve degrees in the second semester but we call it commercial computer systems, it's basically the same subject, the same content. Um the first semester we would ask more Accounting, like do an amortization table and stuff like that, we do more Accounting orientated stuff with them in a test, for instance; the second one I wouldn’t ask them an amortization table because they know the marketing communication and transport management students you now, so they don't really need to know how to use that. It is in the textbook as part of their assignment that they do so it's not um, um, like they not going to do learn how to do it, but I'm not going to test them on it.

Moderator- oh ok

Cherie- so…my tests are not difficult to teach you all your assignments, because everything comes out of there, but I try to make the second semester not so accounting orientated. The second semester for the accounting students we only accounting students we do business information systems 2B, they do Pastel and they do theory. The theory is a book called Business Information Systems in South Africa, we don't actually test them on that ever, they do, let me try and see if I have one here, they do an assignment when they start the first day they do their assignment, um they split up in groups and they do that assignment and they have to hand in that assignment which covers everything in the textbook um, the certain topics that they have to answer but they are not allowed to use um, answers in the textbook. The textbook is there to guide them as to what they supposed to be answering. They have to go and do research on Google and the database that the University has.

Moderator- how is BIS related to Pastel?

Cherie- this is part of the Pastel part

Moderator- oh okay, ok.

Cherie- so that is the third part of the semester, the first class that they get a theory assignment and in the next week we start with the Pastel um, the Pastel computer stuff

Moderator- do they get a manual?

Cherie- ja, they each get a manual with a cd, the Pastel CD which is only um, they get a registration code so that if they wanted to use it, load it at home then they can but it always expires on the 31st of December. Um, because the manual, I don’t know, it used to cost R180, I don’t know how much it is now, it includes the CD and its limited transactions are enough for them to do the assignments if they wanted to complete it at home, so then every week they get the assignment, ja every week we lecture. We have um, we have had six double lectures a week but we now have seven because the students are increasing so much, and um that means that each student sees us for one double lecture. But then we have special, um lectures that are peer practical, and in the practical sessions we help them. Like we'll go around we have assistants that help us in the labs so that we can um, do it properly. You know one person can’t, the lab can take 200 people and one person can’t control and help 200 people, so we appoint about, I have twelve assistants in the first
semester, and 15 in the second semester. The reason for that is, that in my subject we’ve got a recognition of learning in the exam so I lose a few students there, but they don’t have one yet, we’re working on it.

Moderator- how um, where do the assistants come from where do you source your assistants from?

Cherie- past students...

Moderator- oh okay

Cherie- so whoever did it last year or a second year student and we look obviously at what they got for the subject, um and the academic record because we’ve had you know, you can’t take somebody that got 96 for our subject, our subject is not a complicated subject, it’s a practical subject, um it’s really not a difficult subject and the textbooks, the manuals are written in such a way that you can actually sit by yourself and look through that thing without ever attending a lecture but some students don’t and others do and the ones who do, normally do well. But they might just do well in our subject because it’s not so difficult, imagine competing with Accounting and Auditing and all the other things that they do call subjects. Um, and sometimes they do great in ours and do really bad in the others and you look at their academic record and you’ll see things like um, sub sub, sick test, sub sub, exam or whatever, because we just get students that *sigh

Moderator- ja, ja

Cherie- you look at an overall good student and, because it’s a very responsible position and the have mark the assignments, they have to mark the test papers, exam papers and invigilate with us. So it’s a very responsible position and you can’t just appoint anybody that’s not a responsible person. Um, if you want to use a term that might make it very um, understandable people call a lot students nerds because their clever and responsible, those are the students that we appoint as assistants, and their actually all very sweet, very nice people. Um, and we have a lot more um, Afrikaans people that apply than English people in my subject, um and um, we’ve got my first black assistant, but I’ve had lots if Indian assistants before so ja.

Moderator- okay...

Cherie- and I had my first black one this year, and he’s going over with Jurie to 2B

Moderator- oh, okay

Cherie- ja

Moderator- How did what you did with Pastel link up with Edulink?

Cherie- okay, both of us, okay what we do in both of the subjects. 2A and 2B they do four assignments in mine and in Jurie’s they’ve got, it’s one assignment but it split up into say six parts okay, but they all follow on one another and every week for me they have to complete say a word assignment and a PowerPoint assignment, excel assignment and an access assignment. When their done with that, we use the assignment – because they only want PDF formats and we can’t mark it in PDF format. Um so what we do is we use the assignment tool, they have to then upload attach and submit to Edulink, we download it from there and mark it, each and every file gets opened in multiple into a mark sheet. I know Jurie does exactly the same, um they I don’t know if he’s going to change it, the lecturer before him. Um so they had to do say exercise three to four and then they must upload it by that date, um then from exercise one to four and say the next one must be completed by five and must upload when their finished they must hand in for say Pastel now. They must hand in the company, they must back it up and hand it in on Edulink with all of the assignments, and then we download it and mark it. And they also. If I’m not mistaken have to hand in um, a printed copy but I actually did away with that because it’s expensive –

Moderator- how do you ensure that it’s their own work?
Cherie- um, I don’t know, um in Pastel we have, they have to know the company, the last six letters of their student number and they will have to use the sale for their password. I’m not sure if they’ve gotten past um, copying and then changing that, I don’t know. In my subject um, we do, we have things like put in a hyperlink with the screen to text as your initials and surname and your student number. That’s how we catch out my students. I’ve got three files there this year, and it was the worst ever with copying, and also my lowest average ever…

Moderator- Goodness…

Cherie-…in thirteen years. I’m not sure in my case if it’s the fact that office 2007 is extremely different and um that the students that came, um, you’ll see our class attendance is not very great until you have a practical session. When it comes to the lecturing part, I’ve now started taking attendance register for the time and I make a note of everybody that sees me. So that they can see, okay, look nobody sees me I’ve got nine office hours a week I get four students and then they get twelve in the test so I can say why – so I think the students over the years have um, I wouldn’t say they got worse, they just don’t seem to, I think with our subject they don’t take it seriously

Moderator- is that the whole year or just Pastel, or…

Cherie- No it’s the whole year

Moderator-the whole year

Cherie- this subject they have to pass, because I need to get my – that I don’t have to go to class – you know if your results come out on that day you must come and query it no over time – it was due at the end of February – um in June – and then when you have your test you’ve got a 1064 students, when you had a class, you were lucky if you had…except for the M’s classes, the M’s classes were always full. But on the other days I mean you’re lucky if you’ve got um, especially if their writing another test about 14 out of 200, the other day they were writing that week so ja, it’s the um, I think the perception is that it’s easy and we don’t need to go to class and then in the end they finally realise oh my word it’s not that easy we did have to go to class and then towards the end of the semester we become extremely busy and the classes are full again

Moderator- how do you structure your theory classes, how does it, do you say like present, like this is how you open an account, now you go and do it?

Cherie- we use what we call um, the teacher system, and its call synchronise. What you do is, we’ve got um on my computer, I can take over the labs completely, the whole lab. They will then see what I have on my screen, I will then demonstrate – demonstrate to them what, how to do, how to open up a –how to create it, how to set up a company and that’s where we start working with Pastel and um, we’ll demonstrate it to them and we’ll finish, switch off and give them their computers back. Now all they need to do is go and sit down and work while the assistants and the lecturers are there. But the moment we begin, they all get up and go. And then as I said, towards the end they realise oops, because that’s what we have the practical sessions for. Because as I said earlier, we used to have it in Bles101 and 100 and I mean we used to teach without computers, they used to sit and fall asleep in class and I put up a big fight to be able to do that in labs, eventually I got it but then instead of having an Afrikaans double lecture and an English double lecture, we are going to have so many, I said that’s fine. It’s better quality training, its better education; you can’t teach somebody how to use a computer if they’re not in front of one

Moderator- exactly, now when did that start?

Cherie- I think about three years ago

Moderator- oh, only three

Cherie- I can’t remember exactly, but I had to fight a lot for it, but I got it eventually and especially when they bought the Edulink labs and that’s how I finally got it
Moderator- what have you found, the perception of the ability of the students just to go and do their stuff and then submit their files, are they very happy with working with computers compared to many years ago

Cherie- um, some of them absolutely hate it

Moderator- hates it? Why do you think?

Cherie- um ma’am I’ve never liked a computer and I never will and I’m really struggling with your subjects, unless you change your attitude that’s not going to help

Moderator- Really?

Cherie- you have to, and I said when you study to become an accountant one day, now I can tell you now that you are going to walk in there and you start your articles, they are going to give you a laptop and they going to send you off and you’re going to work on excel until it comes out your ears, maybe right through the night, so my dear, I suggest we change your attitude. Start liking a computer, and if you don’t love it, at least learn to put up with it and learn how to do it – I don’t understand, I think that they just don’t think – some of them just don’t get it and I must admit that office 2007 is, if you’ve worked on the other one, it’s a big adjustment to make and we’ve just gone over to it now this year, um it’s a huge adjustment. When we were writing the textbook, we were struggling to find things, I mean things that you used to be able to find in the older version you can’t – but still on the other hand it’s not that hard there’s a menu that says you’re going to edit the general ledger or a this or a that or you’re going to create one or make a new one there’s not that much difference in it you know. So um – I’m going to insert something, so I go and look for insert at the top, we can use the computer and you can read the screen that’s the main thing. But some students have a huge problem with them, um; some of them just don’t get it. And I find that um, maybe these were the students that weren’t exposed to computers before, um but they had been using it since first year because since first year they go onto Edulink to get their notes and slides and stuff there. It’s not that their totally unfamiliar with it, they still have to open the document in PowerPoint to print it, they still have to open word in print it and whatever – I don’t understand why they not getting it, we don’t have a huge failure rate – um, our throughput is good um...

Moderator- have you noticed that generally a lot more happens in front of a computer than the old days or not, not at all. Because now they coming up with these terms about digital natives or digital youngsters are digital natives, and, is that really true?

Cherie- yes, some of them are, but you know I’ve noticed that those are the kids who went to private schools, the kids that were exposed to it, um, um, - maybe with parents who have a bit more money to spend on them – seriously, they walk with iPods they’ve got all these things and they’ll say to me ma’am did you know you can do this like that too inspite of the fact that I say to them, okay there’s like six methods, six ways you can do something on Pastel it works differently, there’s only one way and that’s the right way. On mine you can do it in many different ways – you’ll see it tells you, I say it shows you the easy way, for those of you who are not used to computers, I’ll show you the easy way, the long way we use, but then I briefly tell them about the quick ways, but I found if you go the quick way, long way quick way they sit there and – so I go, this is how you do it, this is how you do it – go to the textbook – say to yourself okay you can do it this way, this way, this way, which way do I like most, which way do I feel comfortable with, which one is the easiest for me and you choose that one. I’m not going to know which one you used at the end of the day but I’ll know you can do the work and that’s what it’s all about, can you use the application. And Pastel, sometimes they have a problem with accounting terminology which they shouldn’t have because they’re accounting students in the second semester, so they should know all these things, and also they, um, in the theory part they learn about all the Business Information Systems so they should know about it. You know, not all students are at the same level, and we going to make announces for that. Um but honestly the digital group I think is people who have been exposed to or that are more privileged than the others, and the ones that – that tend to struggle a bit more. There are all the ones with all the digital thingies that like computers. I’ve got a girl that’s brilliant – she gets good marks for everything and she had just made it into the exam kind of thing you know, why? – and this Afrikaans girl; ‘ek hou net nie van rekenaars nie’. – I think with the digital things, it depends on how much you can afford, because it’s not cheap all the digital stuff. And the ones that do have it they know a lot and they can teach me stuff – and
they do sometimes, they sit and tell me ma’am, did you – ja so, um it’s a hard question but I think personally, I could be
wrong, but I think it’s the more privileged kids that are the digital geniuses. Because if you’re not exposed to it, you’re not
going to learn how to use it

Moderator- ja, how did you find Edulink, and have the students complained about Edulink, and I can’t get on and there’s
no time, it’s always full and how am I supposed to put my assignment…

Cherie- my students have not complained, except when Edulink was down on the day that the assignment was due

Moderator- oh…

Cherie- um, the – I sent it to Ferdinand and Karen – there was another guy and he’s gone and now there’s another girl, I
can’t pronounce her name, we had a very very close relationship we sat down and they gave us the Edulink when they
first changed it, which just did not work for our subject, it did not work – the newer version, put our stuff on the old version
then they got it all sorted out so the following year we went on where everybody else was, we um, we sat down, because
our subject is not like anyone else’s and people often tend to make – and say – does not apply to us our subject is very
different our students only complain when they can’t get on because of the fact that it was off that day. It was a problem, it
was a huge problem but then I extended the time um, I say okay – the following night or whatever. I checked, and I saw it
was off and I realised it – working on the problem and it kept going on and off, so that was a technical problem, normally I
don’t have that problem. They also know that on the days that we write our tests that they know what times and you know,
because we let them know at the beginning of the semester all the dates and times we expect it to be on, if it’s not going to
be on then they must let us know. We don’t have a problem, and we have a student that sits at home, left his assignment
till last minute, it happens all the time and we say it has to be in on a Thursday, normally a Thursday night, I didn’t change
it ever. Um when we made it on a Thursday, I left it on a Thursday – but they’ll wait until 20:55 they might still have dial up
instead of ADSL and it will take seven minutes, - and then they’ll come and complain – because I tell them in the study
guide, I tell them in the first lecture, - don’t wait until the last day, if you have time and you have a problem please come
and talk to us, because if you don’t submit your assignment, it doesn’t get marked you get zero, unless you bring a sick
note. Um over the years we’ve had a lot of problems with students, who take chances, and you will always find it, and the
stories are very good and entertaining to listen to. Um at the end of the day we’re not unreasonable – you can check the
date and time that he worked on, uh normally what I do, I don’t know if Jurie’s going to do it, but, if it’s before 21:00 on that
day, um I will accept it then, but we don’t advertise that – so once it’s up they must attach it and then they must submit it
and then when it’s finished we download it and we mark it, but now what they do on Edulink, and I don’t know how to get
past it I write on the, you know Edulink well, are you from Edulink

Moderator- no no

Cherie- on Edulink when you click on the assignment tool, it’s got a little box with instructions and in that box, I take the
html and I make it big and I make it red – click on submit without attaching the file and they get zero which is a huge
problem. Um quite few have done that, and that is why my average is as well which upsets me. But you know they attach
four assignments, we go through it in class I give them in the study guide, step by step instructions on how to upload and
submit an attached page, and in my test paper I write – even in here I write ‘do not forget to attach the file add the
attachment before clicking submit’ and here I write at the back ‘ensure that the…and that you have uploaded, attached
and submitted all of your files in the correct place and if you are not sure, ask an assistant to help you. So there’s
absolutely no excuse for not attaching and submitting

Moderator- so what do they do in their test? Do you make them do adjustments or, from their own database or –

Cherie- you can only ask it in one way, if you look at my um and even at Jurie’s , if you look at our test papers, it looks like
we’re asking them all the same things and the bottom line is the files that their working in are different they look different,
they are different, we make it different but you can only ask them to insert something on the slide master or to create a
purchase in one way there is no other way to ask it – so if I give you the test paper – or he’s not going to be able to do it or
can do it or he can’t do it, on Edulink that they can download and do, if they did, they can get a 100 but they don’t and um,
with Pastel as well – it makes them setup a company which is also an important part and then he um

Moderator- what do you do in your first test and your second test, you had two tests

Cherie- we only had one test

Moderator- oh only one test

Cherie- the assignments make up the 40% of the first test and we can’t do the assignments because by doing the
assignments they are actually forced to take it and do it

Moderator- ja

Cherie- If we did not do the assignments, if we did away with the assignments some of them wouldn’t bother and try and
come a test and they will all fail, so they have to do the assignments, there is no way we can’t do, so the assignments
take up 40% of the semester mark – the second semester test, and I feel that’s a very important thing because um, if they
are not exposed to a, just the environment before they write the exam, it is not good for them but I don’t think it’s fair to the
student, and that test will then count the other 60% of his final module mark before he goes into the exam, but I think it is
crucial that he is actually exposed to the test environment

Moderator- how long is the tests, two hours? And how long is the exam? Two hours? And it’s in front of a computer under
controlled conditions –

Cherie- no flashes, no usb’s no calculators, and they submit it onto Edulink

Moderator- no calculators no nothing

Cherie- no – um they use calculators if you open, like in mine I say um – to calculate – the loan – and they will then sit and
work it out on their calculators – so the answers mean nothing to us – its creating and setting up the company etc. – so
tasks one to four must be in by Friday task five, in other words not just task five because, it will be one to five so they must
add task five and add it in at that time. Um, they hand in the whole thing and then they hand in their reports – okay, I only
did the first six weeks of this because Hanli was on Maternity leave so, it gives you the customers, it gives you the things
that you have to do, one or two areas that we picked up while we were doing it I know it’s crucial but you can take a look at
it if you like

Moderator- that would be fantastic

Cherie- the areas are very small it’s like when you have to say something like one of these things might just be, if you think
you can pick it up – so I can give you this one, I’ll tell you what, it’s probably the hardest thing for us ever is um translating
all of this into Afrikaans, it’s extremely difficult. If you ever find an n Afrikaans computer dictionary, I’d love to have it okay,
um we have to sometimes make up words we really do. Like if you have to say align something center, what’s an
Afrikaans word for align? I only know the word wheel alignment and you can’t say spoor dit regs of spoor dit…

Moderator- that is such an interesting problem, I don’t…

Cherie- It’s a huge problem for us so and you know what the students to save money they say um print the Afrikaans
papers separate and then do it back to back because it’s a lot less, my Afrikaans students don’t want Afrikaans papers, but
we have to translate it because they did everything in English, the textbooks are in English, the computer is English.
Instead of saying, click on edit you say ‘kliyk op redigeer’ I tried it once and someone complained because I used too
much English in the class – and the words I made up, you have no idea, after ten minutes, a guy raises his hand, ‘mevrou
kan jy asseblief in engels praat’. So they complained because I used too much English and all I did was use the computer
terminology. There is just no way to translate it, there isn’t. It’s so difficult; I make up the most gorgeous words.
Sometimes when I read it I think where did I find that word? Ok now this here is their theory that they are going to do and that's the marking – which is all the theory that they need to do we need to have theory in that particular thing and ja,

Moderator- 2B – must have 2B

Cherie- This is a marking, the whole thing is a marking pack, this is what they get marked on, all their theory okay and then for the first test um, okay this is just your first copy, this is just your notes for me, this then we give them, we make it available on Edulink, we don't have to give it to them, um because of the costing rolls, it's quite a lot. Um so we say to them you can go look at it, but we do go through it in class, first lecture that's what we do for the subject, mine i just do the intro, for theirs we go through the intro, the admin, and then we give them this assignment and briefly go through those to show them okay, this is what it's about, this is what you going to do and then you do this assignment for us

Moderator- okay, and you basically concentrate on the accounting functions on Pastel, there's no other functions that...

Cherie- look, they've got so much that you can do in Pastel but we do setting up a company, doing their books up until the trial balance, um and the final statements. But there isn't a, like the payroll and all that stuff

Moderator- do you get them to design their own financials or not?

Cherie- no

Moderator- okay, oh you don't do payroll either, it's just basically making them comfortable with doing a journal entry, doing a purchase order doing a sale, doing a cashbook entry.

Cherie- the kids receive notes, from the beginning purchase order, they receive notes, delivery notes, they do all kinds of things, you'll see from the assignment, and then um once they done with that they hand it in.

Moderator- is it enough time, six months with Pastel?

Cherie- for what we teach them, ja

Moderator- is it enough?

Cherie- if you wanted them to be able to walk out here with um knowing the entire Pastel, no. But they know how to set up a basic suite of accounts, for a company they will know how to do that but they won't know the um other stuff that Pastel has and I mean Pastel is amazing, it's a great range. What we also going to do this year I'm not sure um, I actually withdrew from the talks. There's a company called Omni Accounts, um their trying to get into the Universities now, and um they trying to give it to us as cheap as possible um so that they can...because it works um I actually bought a package from them, it looks and works like Pastel that's much cheaper. So um I think they are going to come and do this year. Jurie's going to build it into his curriculum to show them Pastel is not the only one, there are other books from accounting packages so, we are going to do a demonstration to show them, but really there's not much of a difference between them. Except for us it would be a price. We only pay Pastel an admin fee though, so it's about R3 000 to R4 000, I don't know if it's gone up since I had done it

Moderator- is that all? For the licence? Only R3 000 or R4 000 a year?

Cherie- ja, maybe there's a...

Moderator- but you pay for the manual separately?

Cherie- yes, the manuals are separately, we get that through master skill, they are the only ones that are allowed to sell it for Pastel as well

Moderator- oh, okay, I'll get this file back to you...
Cherie- that’s last year’s file, I don’t need it, and Jurie’s got a copy

Moderator- are you sure?

Cherie- ja

Moderator- excellent, thank you very much.

Cherie- so you can have a look at it at your leisure and see what they do

Moderator- yes, okay, um do you ever speak to the accounting lecturers and say, what do you want us to focus on or do you just stick to that debit order credit sales…

Cherie-Um,

Moderator-…basic stuff, do you ever say, do you ever try and link up with what their trying to do in accounting or is it totally separate. Have they ever approached you?

Cherie- no, we are busy with that, um I don’t know if they are going to involve us in that section though, um but what they are trying to do with the core subjects is to say, here is a company and um, in tax you can give them the same question in tax and accounting for instance and then they’ve got to answer it from a different, from an accounting perspective or from a tax perspective. So they are doing it in the core subjects. Um, with our subjects um, I’ve concentrated in my subject, talking to um, I’m still friendly with a lot of my ex-students. And when they come and visit me um, and they say okay, this is what we are doing, and you didn’t teach us how to do this or this is what we didn’t do we don’t use this so we can take that out for instance…

Moderator- so you now get people who are now working, coming back to you…

Cherie- and telling me that, like now there’s this one that’s doing his articles, he says to me I have to teach them perfect tables, I must put perfect tables back in, my textbook. Which I will now do, like he’s given me a whole thing on um what it is what they use it for, and how they going to use it so that I can then pedigree, and when they walk into that company they will know how to use it. So that’s what I’ve done, but that’s just from…

Moderator- you personally want to…

Cherie- my personal…ja…I didn’t um…

Moderator- ja

Cherie- …do anything else. With Pastel, um, I think it’s going to be a bit hard for us to, with what we get from Pastel, to teach them anything that they um doing, um they do, I know we do a depreciation account but I don’t think we do actual calculations in Pastel, type of thing. Um we don’t go very far, so I’m not sure if it’s going to make a difference at the end if we say to them what would you like us to do, because we don’t have the whole system and we wouldn’t have time to do the whole system in six months. Um and I’ve said this before, what I would like to do is or what I would like to see is, for them they learning to do computers in the first year, second year, excuse me, Third year no computers. Honest no computers and then they walk in to a company and they expect them to remember what we taught them two years ago, they don’t and the guy’s actually told me that – there’s no time for them in third year to learn how to use Microsoft office granted, or Pastel, but I think that somewhere along the line we’d love to see them um like in tax for instance make some arrangement to complete a tax form on a computer or to do some um accounting in excel. You know, I’d love to see that, um incorporated so they don’t forget how to do it.

Moderator- yes, a much more appropriate relationship between that hardware, the computers…

Cherie- and the actual subject.
Moderator- because, that’s what we live with someday.

Cherie- and especially for our BCom. Accounting students I mean this is what they going to do, they are going to be working on computers. And they do, I know they do, my daughter’s just started with BWC and that’s how, I mean, she’s got her – I said do you have a laptop, she said yes, okay, do a chart for this. She was only in her first year, she hadn’t even done my course yet, so um, you know

Moderator- so do you…

Cherie- especially excel

Moderator- would you like to see first, second, fourth year, some computers in the students’ lives

Cherie- I’d like to see it incorporated somewhere yes, um I wouldn’t say…you know in Stellenbosch my step daughter was there and they did what they call info’s which is very much what we do, Pastel, but it’s only one subject for them. It’s also one subject for us, um but one module a year. They for instance take almost a year to do excel… - that’s a bit excessive I think. Um but they had some form of computers a year in Stellenbosch and um, they did more theory than us, but the theory is all repeated in auditing anyway so it’s not, we’ve over the years…I got it kicked out totally, but then they brought it back in, because the one lecturer wanted it. We don’t actually need the theory, because it’s all covered in the other subjects. – in the core subjects. So ja um I would like them to make use of, I would go and say go and teach second, third and fourth year something but I would like to see them incorporate a part of what they’ve learnt in their subjects, even if it’s just like doing financial statements or whatever. And I think concentrating on things like completing something online, um or on the computer, or a um, doing some accounting thing in excel, which is what they are going to need. So I would like to see that, but it hasn’t happened yet, and I’m not sure if it will. I think a lot of people still underestimate the…they all use it every day they all know it’s important, but the actual training – did very well in his honours and he couldn’t remember how to do something, and he says to me – he could do it, it’s now and then he goes to work. It’s true about computers, we don’t use it to lose it, so ja, we would love to see to but I doubt it will ever happen.

Moderator- no, it will, it has to. We have to be the best University.

Cherie- ja, I know it would be cool if we do that. Also I’d love to see the students take the subject to the fourth year level, which they don’t

Moderator- do you see a need, more computer labs, do you think that’s necessary, more access to the labs?

Cherie- students have a problem that they have to stand in long queues to get into the labs. Um and I don’t think that’s right, um and it’s not because the labs aren’t open, it because they are too full. We could probably do with a few more or we must make an arrangement where you can say split it in surnames so you know you’re entitled to the lab hour or your lab time during this time…because a lot of them complain to me that they have to travel all the way and then they have to stand in the queue for ever to get in. Whereas if they knew surname: A to M or whatever – that’s not how you teach computers. So that’s how we work.

Moderator- thank you so much for your time, thank you very very much again

Cherie- see our subjects are very different, very complicated at times compared to normal ones

Moderator- yes